A0006851

ROUTING OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE FOR APPROVAL

(Used to route ENG Form 4025 with items attached. Not to become a part of the Contractor's record.)

	TO:	FROM:	DATE
1	C/Const	A/E, New Orleans	11/14/94

The attached items listed on ENG Form 4025 are forwarded for approval action.

CONTRACT NUMBER	CONTRACTOR
94-C-0079	B & K Const Co., Inc.
TRANSMITTAL NUMBERS	**PROJECT TITLE AND LOCATION**
Items 26 + 29 Formwork design calculations + shop dwgs	London Ave Canal Floodwall, L.C. Simon + Miraldi

COMMENTS *(Attach additional sheet, if necessary.)*
Request your office review the attached Formwork shop drawings & design calculations resubmittal & furnish any comments to NOAD by 28 Nov 94. POC is Chris Wagner x1224

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
1	Dennis Duhon, Supv Civ Engr	NOV 15 1994

	TO:	FROM:	DATE
2	C/Engr Div	C/Const Div	11/15/94

COMMENTS *(Attach additional sheet, if necessary.)*
Pls review & Cmt by COB 27 Nov 94. POC is Jim Berry X1240

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
1	RICHARD T. HILL	Richard T. Hill

	TO:	FROM:	DATE
3	C/Const Div	C/Engr Div	12/6/94

COMMENTS *(Attach additional sheet, if necessary.)*
Not recommended for approval. Please resubmit.

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
2	W. Eugen Tickner C/Engr Div	

	TO:	FROM:	DATE
4			

The following action codes are given to items listed on ENG Form 4025:

ACTION CODES

A - APPROVED AS SUBMITTED.

B - APPROVED, EXCEPT AS NOTED ON DRAWINGS. RESUBMISSION NOT REQUIRED.

C - APPROVED, EXCEPT AS NOTED ON DRAWINGS. REFER TO ATTACHED SHEET. RESUBMISSION REQUIRED.

D - WILL BE RETURNED BY SEPARATE CORRESPONDENCE.

E - DISAPPROVED (SEE ATTACHED)

F - RECEIPT ACKNOWLEDGED

G - OTHER *(specify)*

ACTION CODES TO BE INSERTED IN COLUMN G, SECTION I, ENG FORM 4025 *(Attach sheets, when required.)*

ITEM NO. (Taken from ENG Form 4025)								
CODE GIVEN								

REMARKS

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE

ENG FORM 1 NOV 74 4026 EDITION OF NOV 66 MAY BE USED.

★U.S. G.P.O. 1985-521-246/593

Formwork Submittal

1. Drawing. According to the dimensions on "Section A", the formwork is 42'-4" tall. The maximum floodwall height is 12'. Please resolve dimension discrepancies.

2. Calculations, Page 1 0f 9. Reference table for "Maximum Lateral Pressure for Design of Wall Forms" on dwg. 94089-1. The permissible pour rate is dependent on the temperature at the time of placement. The rates shall be limited in the field so that the maximum pressure is limited to 1000 psf.

3. Numerical discrepancies are annotated in red on the enclosed calculations.

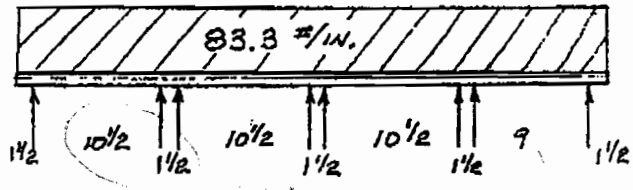
WALLFORM CALCULATIONS

DESIGN PRESSURE = 1000 PSF (SHORT DURATION)

VERSIFORM PANELS ARE 4'x8' STEEL FRAMES WITH 3/4" HDO PLYFORM RIGIDLY ATTACHED

3/4 PLYFORM -

F_b = 1930 psi E = 1,650,000 psi F_s = 102 psi
K_s = .5033 in^3/ft I = .1417 in^4/ft I_b/Q = 5.3547 in^2/ft



ALLOW M = 971 "#
ALLOW DEFL = $\ell/360$ = .029" ✓

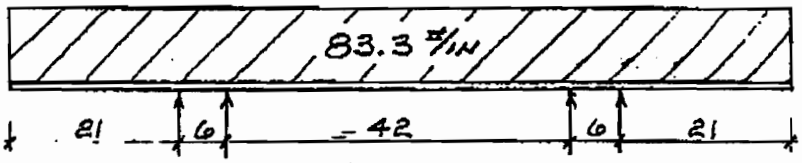
FROM COMPUTER RUN PG 2 - MAX M = 926 "# < 971 "# .O.K.
MAX DEFL = .022 < .029 .O.K.

CK. FOR ALLOWABLE LOAD BASED ON SHEAR STRESS

$$W_s = \frac{20 F_s (I_b/Q) \times 12}{\ell_2} = \frac{20 \cdot 102 \cdot 5.3547 \cdot 12}{10.5} = 1040\ \#/SF > 1000\ \#/SF$$ O.K.

3" VERSIFORM STIFFENER - C 3x4.1 @ 12" o.c. MAX.

F_b = 23760 psi E = 29,000,000 psi F_v = 14,400 psi
S_x = 1.10 in^3 I = 1.66 in^4 d = 3.0 t_w = .170



ALLOW M = 26,136 "#
ALLOW DEFL = $\ell/360$ = .117"
ALLOW V = 7344 #

FROM COMPUTER RUN PAGE 3 - MAX M = 18368 "# < 26,136 "# O.K.
MAX DEFL = .062" < .117" O.K.
MAX V = 1749 < 7344 O.K.

3/4 HDO Plyform On Versiform Panel

OVERALL LENGTH = 48.000 E = 1650000. I = 0.142

LOADINGS

TYPE	START	END	MAGNITUDE
UNIF. LD	0.000	48.000	83.300

UNKNOWN REACTIONS		BOUNDARY CONDITIONS		
CONC. LD AT X =	1.500	AT X =	1.500 DEFL.	= 0.000
CONC. LD AT X =	12.000	AT X =	12.000 DEFL.	= 0.000
CONC. LD AT X =	13.500	AT X =	13.500 DEFL.	= 0.000
CONC. LD AT X =	24.000	AT X =	24.000 DEFL.	= 0.000
CONC. LD AT X =	25.500	AT X =	25.500 DEFL.	= 0.000
CONC. LD AT X =	36.000	AT X =	36.000 DEFL.	= 0.000
CONC. LD AT X =	37.500	AT X =	37.500 DEFL.	= 0.000
CONC. LD AT X =	46.500	AT X =	46.500 DEFL.	= 0.000

REACTIONS--

CONC. LD AT X =	1.500	MAGNITUDE	-483.041
CONC. LD AT X =	12.000	MAGNITUDE	-761.537
CONC. LD AT X =	13.500	MAGNITUDE	-314.590
CONC. LD AT X =	24.000	MAGNITUDE	-509.552
CONC. LD AT X =	25.500	MAGNITUDE	-492.296
CONC. LD AT X =	36.000	MAGNITUDE	-524.726
CONC. LD AT X =	37.500	MAGNITUDE	-473.321
CONC. LD AT X =	46.500	MAGNITUDE	-439.337

LOCATION	DEFLECTION	SLOPE	MOMENT	SHEAR
0.000	-0.013027	0.008635	0.00	0.00
1.499	-0.000009	0.008834	-93.59	-124.87
1.500	0.000000	0.008835	-93.71	358.09
4.000	0.019936	0.005985	541.20	149.84
8.000	0.022366	-0.004579	474.17	-183.36
11.999	0.000003	-0.002625	-925.15	-516.48
12.000	0.000000	-0.002621	-925.67	244.98
13.499	-0.000002	0.002326	-652.03	120.11
13.500	0.000000	0.002329	-651.91	434.62
16.000	0.010265	0.004414	174.32	226.37
20.000	0.015455	-0.002499	413.40	-106.83
23.999	0.000002	-0.002120	-679.89	-439.95
24.000	0.000000	-0.002117	-680.33	69.52
25.499	-0.000003	0.002102	-669.71	-55.35
25.500	0.000000	0.002105	-669.76	436.87
28.000	0.009918	0.004351	162.09	228.62
32.000	0.015170	-0.002430	410.15	-104.58
35.999	0.000001	-0.002072	-674.15	-437.70
36.000	-0.000002	-0.002069	-674.58	86.94
37.499	-0.000002	0.002029	-637.84	-37.92
37.500	-0.000001	0.002032	-637.88	435.31
40.000	0.009330	0.003958	190.09	227.06
44.000	0.012125	-0.003248	431.94	-106.14
46.499	0.000005	-0.005515	-93.40	-314.30
46.500	0.000007	-0.005515	-93.72	124.95
47.999	-0.008039	-0.005315	-0.01	0.08
48.000	-0.008042	-0.005315	0.00	0.00

**

3" Versiform Stiffeners @ 12" oc

OVERALL LENGTH = 96.000 E = 29000000. I = 1.660

LOADINGS

TYPE	START	END	MAGNITUDE
UNIF. LD	0.000	96.000	83.300

UNKNOWN REACTIONS		BOUNDARY CONDITIONS		
CONC. LD AT X =	21.000	AT X =	21.000 DEFL. =	0.000
CONC. LD AT X =	27.000	AT X =	27.000 DEFL. =	0.000
CONC. LD AT X =	69.000	AT X =	69.000 DEFL. =	0.000
CONC. LD AT X =	75.000	AT X =	75.000 DEFL. =	0.000

REACTIONS--

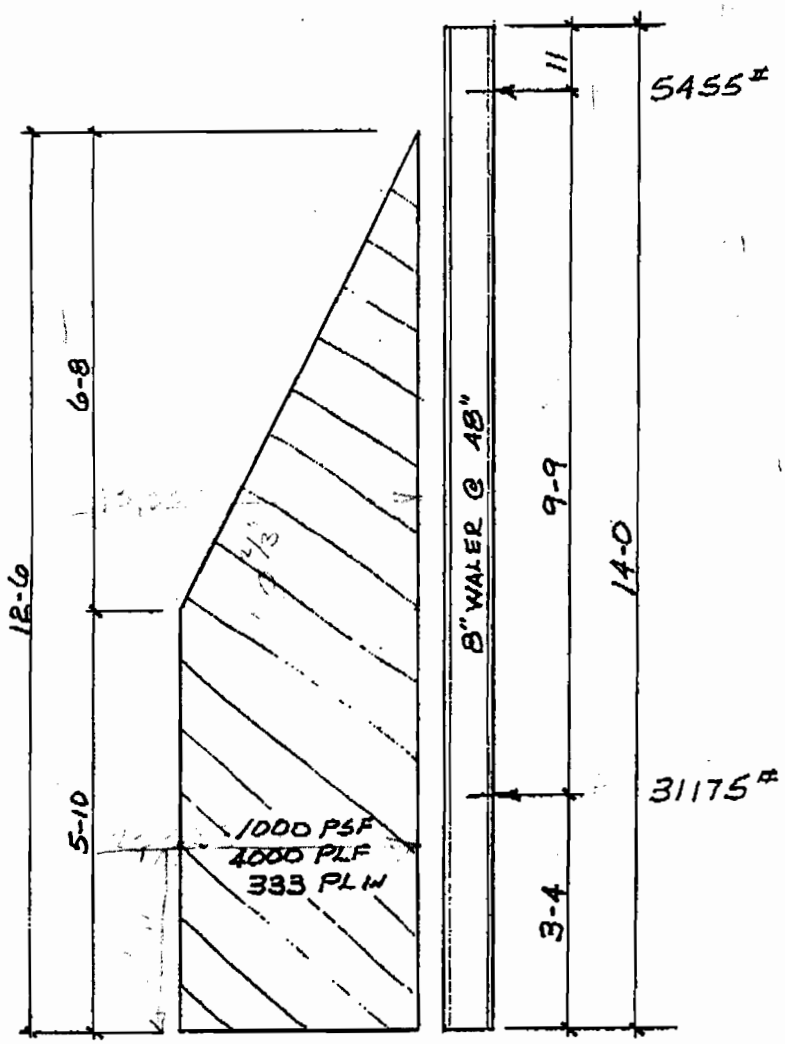
CONC. LD AT X =	21.000	MAGNITUDE	-3324.760
CONC. LD AT X =	27.000	MAGNITUDE	-673.639
CONC. LD AT X =	69.000	MAGNITUDE	-673.654
CONC. LD AT X =	75.000	MAGNITUDE	-3324.748

LOCATION	DEFLECTION	SLOPE	MOMENT	SHEAR
0.000	0.062306	-0.003635	0.00	0.00
4.000	0.047786	-0.003616	-666.40	-333.20
8.000	0.033524	-0.003487	-2665.60	-666.40
12.000	0.020185	-0.003136	-5997.60	-999.60
16.000	0.008877	-0.002453	-10662.40	-1332.80
20.000	0.001149	-0.001328	-16660.00	-1666.00
20.999	0.000001	-0.000964	-18365.90	-1749.22
21.000	0.000000	-0.000964	-18367.65	1575.46
24.000	-0.001316	0.000041	-14016.12	1325.56
26.999	-0.000001	0.000798	-10415.37	1075.74
27.000	0.000000	0.000799	-10414.29	1749.30
28.000	0.000901	0.000997	-8706.64	1666.00
32.000	0.005985	0.001462	-2709.05	1332.80
36.000	0.012007	0.001484	1955.74	999.60
40.000	0.017416	0.001174	5287.74	666.40
44.000	0.021104	0.000642	7286.93	333.20
48.000	0.022408	0.000000	7953.33	0.00
52.000	0.021104	-0.000642	7286.92	-333.20
56.000	0.017416	-0.001174	5287.71	-666.40
60.000	0.012007	-0.001484	1955.71	-999.60
64.000	0.005985	-0.001462	-2709.10	-1332.80
68.000	0.000901	-0.000997	-8706.72	-1666.00
68.999	0.000001	-0.000799	-10412.61	-1749.22
69.000	0.000000	-0.000799	-10414.36	-1075.65
72.000	-0.001316	-0.000041	-14016.16	-1325.55
74.999	-0.000001	0.000963	-18366.07	-1575.36
75.000	0.000000	0.000964	-18367.65	1749.30
76.000	0.001149	0.001328	-16660.00	1666.00
80.000	0.008877	0.002453	-10662.39	1332.80
84.000	0.020186	0.003136	-5997.60	999.60
88.000	0.033524	0.003487	-2665.61	666.40
92.000	0.047786	0.003616	-666.42	333.20
95.999	0.062303	0.003635	0.02	0.08
96.000	0.062307	0.003635	0.01	0.00

8" VERSIFORM WALERS @ 48" o.c - DBL C8x11.5

F_b = 23,760 psi E = 29,000,000 F_v = 14,400 psi
S_x = 16.28 IN^3 I = 65.20 IN^4 d = 8.0 tw = .220

LOADING AT SECTION 'A'



ALLOW M = 386,813"#
ALLOW DEFL = .25" = $\ell/468$
ALLOW V = 25,344 # ✓

FROM COMPUTER RUN PAGE 5 - MAX M = 266,399"# < 386,813"# ✓
MAX DEFL = .148" < .25" ✓
MAX V = 17855 < 25,344 ✓
O.K.

31205 5460

8" Walers @ 4' - 12'-6" Pour - 1000psf

OVERALL LENGTH = 168.000 E = 29000000. I = 65.200

LOADINGS

TYPE	START	END	MAGNITUDE
RAMP-INC	18.000	98.000	333.000
UNIF. LD	98.000	168.000	333.000

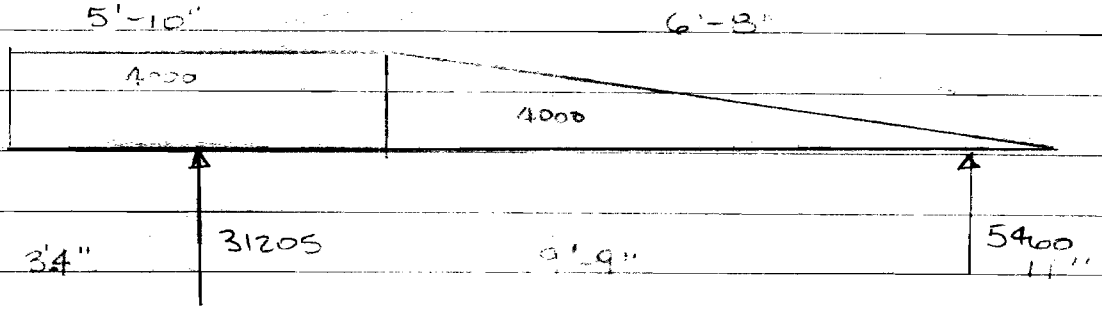
UNKNOWN REACTIONS
CONC. LD AT X = 11.000
CONC. LD AT X = 128.000

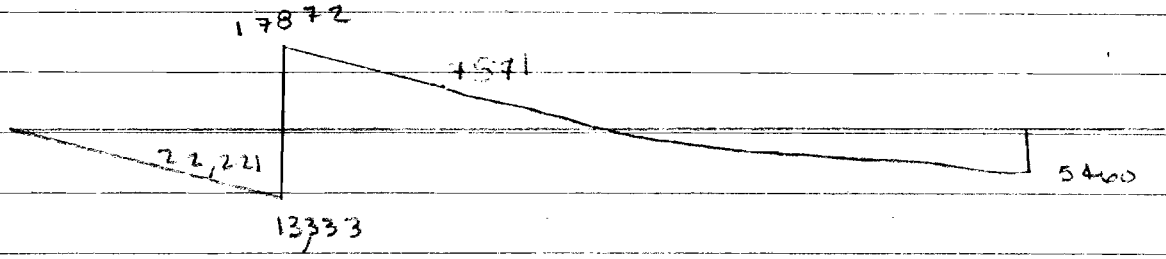
BOUNDARY CONDITIONS
AT X = 11.000 DEFL. = 0.000
AT X = 128.000 DEFL. = 0.000

REACTIONS--
CONC. LD AT X = 11.000 MAGNITUDE -5455.140
CONC. LD AT X = 128.000 MAGNITUDE -31174.865

TIE LOADS

LOCATION	DEFLECTION	SLOPE	MOMENT	SHEAR
0.000	-0.044670	0.004061	0.00	0.00
6.000	-0.020305	0.004061	0.00	0.00
10.999	-0.000004	0.004061	0.00	0.00
11.000	0.000000	0.004061	0.00	5455.14
12.000	0.004060	0.004059	5455.14	5455.14
17.999	0.028257	0.003990	38180.53	5455.14
18.000	0.028261	0.003990	38185.98	5455.14
24.000	0.051735	0.003817	70766.96	5380.21
30.000	0.073863	0.003542	102448.86	5155.44
36.000	0.094043	0.003169	132332.53	4780.81
42.000	0.111709	0.002705	159518.92	4256.34
48.000	0.126342	0.002160	183108.92	3582.01
54.000	0.137497	0.001548	202203.41	2757.84
60.000	0.144810	0.000883	215903.30	1783.81
66.000	0.148022	0.000184	223309.50	659.94
72.000	0.146994	-0.000527	223522.87	-613.79
78.000	0.141723	-0.001226	215644.34	-2037.36
84.000	0.132361	-0.001886	198774.84	-3610.79
90.000	0.119230	-0.002477	172015.23	-5334.06
96.000	0.102840	-0.002966	134466.44	-7207.19
97.999	0.096774	-0.003101	119405.00	-7864.53
98.000	0.096771	-0.003101	119397.16	-7864.86
102.000	0.083910	-0.003318	85273.74	-9196.86
108.000	0.063374	-0.003495	24098.56	-11194.86
114.000	0.042399	-0.003458	-49064.59	-13192.86
120.000	0.022377	-0.003171	-134215.77	-15190.86
126.000	0.004929	-0.002594	-231354.92	-17188.86
127.999	0.000001	-0.002331	-266380.81	-17854.53
128.000	-0.000002	-0.002331	-266398.69	13320.01
132.000	-0.008270	-0.001822	-215782.62	11988.01
138.000	-0.017365	-0.001245	-149848.59	9990.01
144.000	-0.023587	-0.000858	-95902.66	7992.01
150.000	-0.027964	-0.000623	-53944.44	5994.01
156.000	-0.031295	-0.000503	-23974.44	3996.01
162.000	-0.034150	-0.000458	-5992.50	1998.01
167.999	-0.036872	-0.000452	1.75	0.34
168.000	-0.036873	-0.000452	1.62	0.01

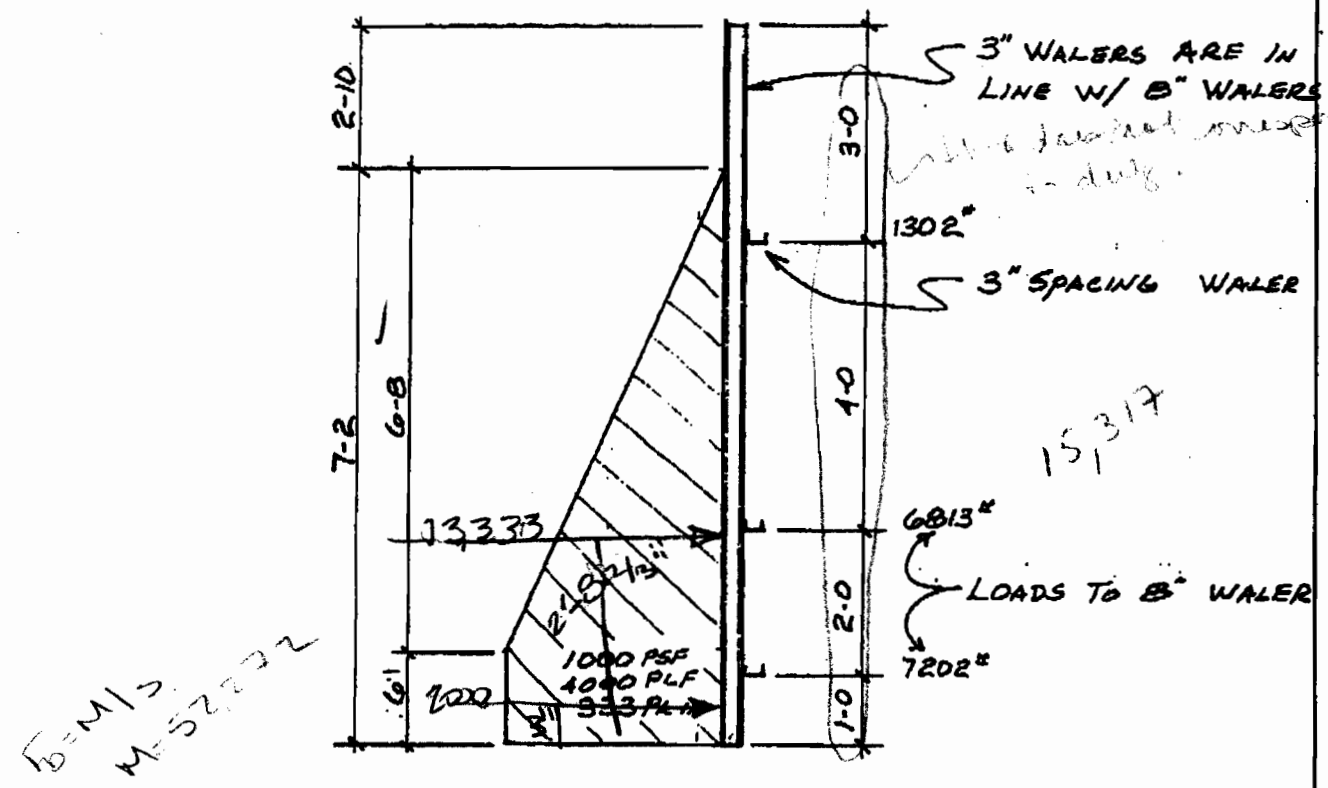

5'-10"
6'-3"
4000
4000
3'4"
31205
9'-9"
54000


17872
4571
22,221
13333
5460

LOADING AT SECTION 'B'

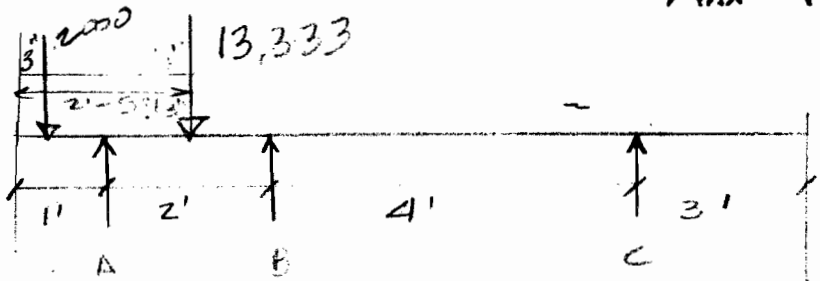
3" VERSIFORM VERTICAL WALERS @ 48" O.C. - DBL C3X4.1

$F_b = 23760$ psi ✓ $E = 29{,}000{,}000$ psi ✓ $F_v = 14{,}440$ psi ✓
$S_x = 2.20$ in^3 ✓ $I = 3.32$ in^4 $d = 3.0$ ✓ $t_w = .170 \times 2$ ✓



ALLOW M = 52,272 "# ✓
ALLOW DEFL = $\ell/360$ = .133" ✓ 48/360 = .133
ALLOW V = 14,729 # 14688 ✓

FROM COMPUTER RUN PAGE 7 - MAX M = 24,199 "# < 52,272 "# ✓ O.K
MAX DEFL = .041" < .133" ✓ O.K
MAX V = 3921 # < 14,729 # O.K
14689



$R_A + R_B + R_C = 15{,}333$

$R_C = 15333 - R_A - R_B$

$\Sigma M_A = 0$
$-2000(9") + 13333(1'-8\frac{1}{3}") - R_B(2) - R_C(6)$
$21462 = 2R_B + 6R_C$

$\Sigma M_C = 0$
$2000(6'-9") + 1333(7'-2'-8\frac{1}{3}") - R_A(6) - R_B(4)$
$70,536 = 6R_A + 4R_B$

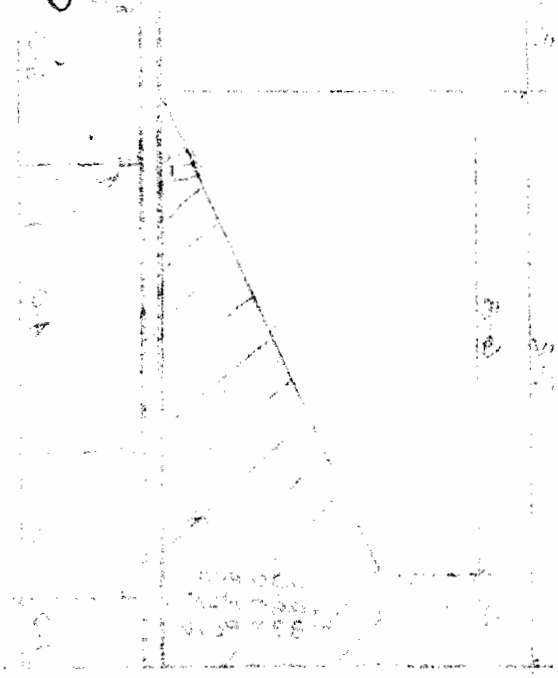
$21462 = 2R_B + 6(15333 - R_A - R_B)$

$70536 = 6R_A + 4R_B$

$-70536 = -4R_A - 4R_B$

$70536 = 6R_A + 4R_B$

$26 = 2R_A$



899-1836
Jay

$+\circlearrowleft \Sigma M_A = 0$

$+2000(9') - 13333\left(1' - 8^2/3''\right) + R_B(\quad) + R_C(6')$

$21462 = 2R_B + 6R_C$

$+\circlearrowright \Sigma M_B = 0$

$2000(3 - 9') + 13333\left(3' - 2' - 8^2/3''\right) + R_C(4') - R_A(\quad)$

$-8203 = 2R_A - 4R_C \qquad R_A = 2R_C + 4101.5$

$+\circlearrowleft \Sigma M_C = 0$

$-6R_A - 4R_B + 1333\left(7' - 2' - 8^2/3''\right) + 2000(7' - 3')$

$70536 = 6R_A + 4R_B$

$R_A + R_B + R_C = 15333$

$21462 = 2R_A + 6R_C$

$70536 = 6(2R_C + 4101.5) + 4R_B$

$= 12R_C + 24609 + 4R_B$

$45926 = 12R_C + 4R_B$

$21462 = 6R_C + 2R_B$

3" Walers @ 4' - 10'-0" Tall - 1000psf

OVERALL LENGTH = 120.000 E = 29000000. I = 3.320

LOADINGS

TYPE	START	END	MAGNITUDE
RAMP-INC	34.000	114.000	333.000
UNIF. LD	114.000	120.000	333.000

UNKNOWN REACTIONS

CONC. LD AT X = 36.000
CONC. LD AT X = 84.000
CONC. LD AT X = 108.000

BOUNDARY CONDITIONS

AT X = 36.000 DEFL. = 0.000
AT X = 84.000 DEFL. = 0.000
AT X = 108.000 DEFL. = 0.000

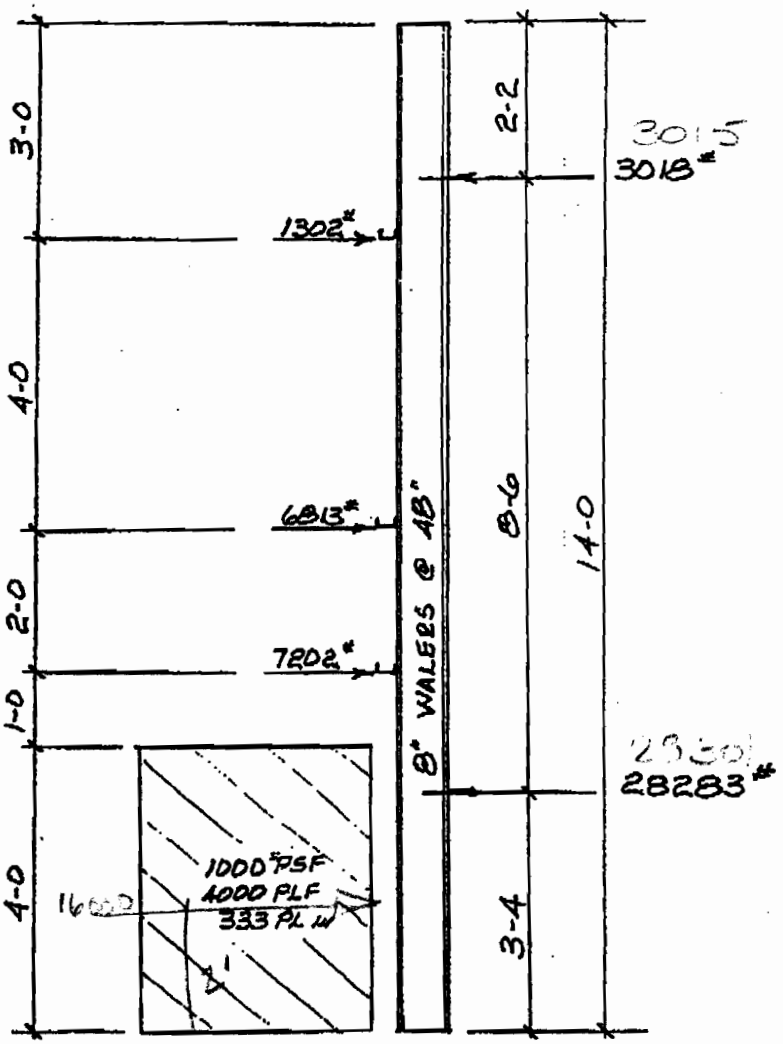
REACTIONS--

CONC. LD AT X = 36.000 MAGNITUDE -1302.496
CONC. LD AT X = 84.000 MAGNITUDE -6813.270
CONC. LD AT X = 108.000 MAGNITUDE -7202.235

LOCATION	DEFLECTION	SLOPE	MOMENT	SHEAR
0.000	-0.102574	0.002849	0.00	0.00
6.000	-0.085478	0.002849	0.00	0.00
12.000	-0.068383	0.002849	0.00	0.00
18.000	-0.051287	0.002849	0.00	0.00
24.000	-0.034191	0.002849	0.00	0.00
30.000	-0.017096	0.002849	0.00	0.00
33.999	-0.005701	0.002849	0.00	0.00
34.000	-0.005699	0.002849	0.00	0.00
35.999	-0.000003	0.002849	-5.54	-8.32
36.000	0.000000	0.002849	-5.55	1294.17
42.000	0.016620	0.002613	7459.77	1169.30
48.000	0.030489	0.001944	13726.30	894.57
54.000	0.039290	0.000946	17894.92	470.00
60.000	0.041494	-0.000224	19066.55	-104.43
66.000	0.036690	-0.001350	16342.07	-828.70
72.000	0.025925	-0.002161	8822.40	-1702.83
78.000	0.012039	-0.002331	-4391.58	-2726.80
83.999	0.000001	-0.001477	-24195.05	-3900.42
84.000	0.000000	-0.001477	-24198.96	2912.64
90.000	-0.005305	-0.000433	-10619.21	1588.97
96.000	-0.006377	0.000021	-5431.06	115.44
102.000	-0.005130	0.000437	-9533.61	-1507.93
107.999	-0.000001	0.001421	-23822.69	-3280.85
108.000	0.000000	0.001421	-23825.98	3921.08
113.999	0.011689	0.002290	-5995.80	1998.33
114.000	0.011691	0.002290	-5993.84	1998.00
119.999	0.025992	0.002415	0.18	0.34
120.000	0.025994	0.002415	0.20	0.00

8" VERSIFORM WALERS @ 48" o.c. - DBL CB x 11.5

(SEE PAGE 4 FOR PROPERTIES)



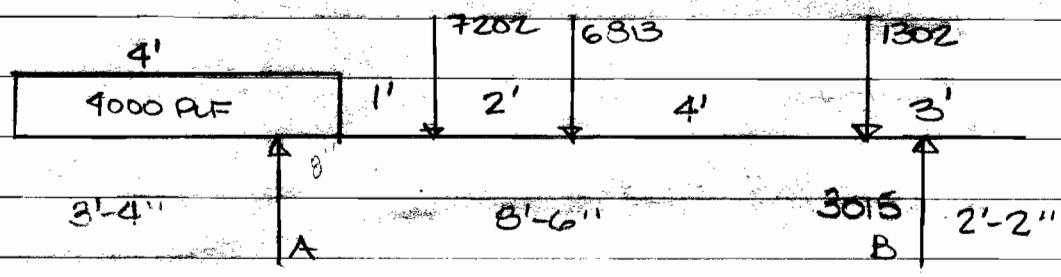
ALLOW. M = 386,813 "# ✓
ALLOW. DEFL = .25" = ℓ/408
ALLOW V = 25,344 # ✓

FROM COMPUTER RUN PAGE 9 - MAX M = 266,400 "# < 386,813 "#
MAX DEFL = .041" < .25"
MAX V = 14297# < 25,344#
14967 O.K.

1½" SHE-BOLT TIES

SAFE WORKING LOAD = 37,000#

MAX LOAD = 31,175# < 37,000#
SEE COMPUTER RUN - PAGE 5 O.K.



$+\circlearrowleft \Sigma M_A = 0$

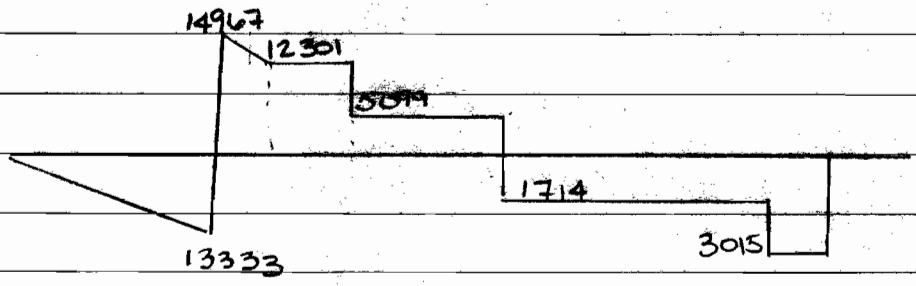
$-4'(4000)(1'-4") + 7202(1'-8) + 6813(3'-8") + 1302(7'-8")$
$- R_B(8'-6")$

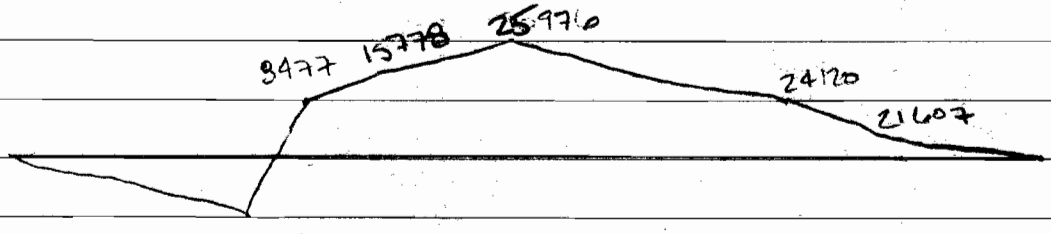
$R_B = 3015$

$+\circlearrowleft \Sigma M_B = 0$

$R_A(8'-6") - 4'(4000)(9'-10") - 7202(6'-10') - 6813(4'-10")$
$- 1302(10")$

$R_A = 28,301$





M_{MAX} 311,712 in·lb

8" Walers @ 4' - 11'-2" Pour - 1000psf

OVERALL LENGTH = 168.000 E = 29000000. I = 65.200

LOADINGS

TYPE	START	END	MAGNITUDE
CONC. LD	36.000	36.000	1302.000
CONC. LD	84.000	84.000	6813.000
CONC. LD	108.000	108.000	7202.000
UNIF. LD	120.000	168.000	333.000

UNKNOWN REACTIONS
CONC. LD AT X = 26.000
CONC. LD AT X = 128.000

BOUNDARY CONDITIONS
AT X = 26.000 DEFL. = 0.000
AT X = 128.000 DEFL. = 0.000

REACTIONS--
THE LOADS
CONC. LD AT X = 26.000 MAGNITUDE -3018.155
CONC. LD AT X = 128.000 MAGNITUDE -28282.842

LOCATION	DEFLECTION	SLOPE	MOMENT	SHEAR
0.000	-0.034843	0.001340	0.00	0.00
6.000	-0.026802	0.001340	0.00	0.00
12.000	-0.018761	0.001340	0.00	0.00
18.000	-0.010721	0.001340	0.00	0.00
24.000	-0.002680	0.001340	0.00	0.00
25.999	-0.000001	0.001340	0.00	0.00
26.000	0.000000	0.001340	0.00	3018.15
30.000	0.005344	0.001327	12072.62	3018.15
35.999	0.013134	0.001260	30178.53	3018.15
36.000	0.013135	0.001260	30181.55	1716.15
42.000	0.020377	0.001148	40478.48	1716.15
48.000	0.026848	0.001003	50775.41	1716.15
54.000	0.032352	0.000826	61072.34	1716.15
60.000	0.036694	0.000616	71369.27	1716.15
66.000	0.039677	0.000373	81666.20	1716.15
72.000	0.041105	0.000098	91963.12	1716.15
78.000	0.040781	-0.000211	102260.05	1716.15
83.999	0.038512	-0.000551	112555.27	1716.15
84.000	0.038511	-0.000551	112556.98	-5096.85
90.000	0.034228	-0.000860	81975.91	-5096.85
96.000	0.028384	-0.001072	51394.83	-5096.85
102.000	0.021561	-0.001186	20813.77	-5096.85
107.999	0.014343	-0.001204	-9762.22	-5096.85
108.000	0.014342	-0.001204	-9767.31	-12298.85
114.000	0.007446	-0.001056	-83560.37	-12298.85
119.999	0.002142	-0.000674	-157341.16	-12298.85
120.000	0.002141	-0.000674	-157353.44	-12298.85
126.000	-0.000158	-0.000051	-237140.53	-14296.85
127.999	0.000001	0.000215	-266385.22	-14962.51
128.000	0.000001	0.000215	-266400.22	13320.00
132.000	0.001917	0.000725	-215784.22	11988.00
138.000	0.008099	0.001301	-149850.25	9990.00
144.000	0.017154	0.001688	-95904.28	7992.00
150.000	0.028053	0.001923	-53946.31	5994.00
156.000	0.039999	0.002043	-23976.31	3996.00
162.000	0.052420	0.002088	-5994.31	1998.00
167.999	0.064973	0.002094	-0.25	0.33
168.000	0.064975	0.002094	-0.37	0.00

TECHNICAL DATA

	Criterion		RECOMMENDED LOADS (psf) SPAN IN INCHES					
			4	8	12	16	19.2	24
1/2" 5 PLY	Face grain PERPENDICULAR to supports	L/360	9072	1548	505	217	126	64
		L/270	12096	2063	673	290	167	85
		L/180	18144	3095	1009	434	251	127
		Bending	4764	1191	529	298	207	132
		Shear	4148	1595	988	715	586	461
	SECTION DATA (a)		Fb = 1930 psi KS = .3285 in. 3/ft		E = 1,650,000 psi I = .0966 in. 4/ft		Fs = 102 psi lb/Q = 5.0643 in. 2/ft	
	Face grain PARALLEL to supports	L/360	5146	674	194	79	55	28
		L/270	6861	899	258	105	74	37
		L/180	10291	1349	387	157	111	55
		Bending	2761	690	307	173	96	61
		Shear	2358	907	561	407	320	252
	SECTION DATA (a)		Fb = 1930 psi KS = .1904 in. 3/ft		E = 1,650,000 psi I = .032 in. 4/ft		Fs = 102 psi lb/Q = 2.8789 in. 2/ft	
17MM 7 PLY	Face grain PERPENDICULAR to supports	L/360	11776	2450	918	427	256	134
		L/270	15702	3267	1224	569	342	179
		L/180	23552	4901	1836	854	513	269
		Bending	8033	2008	893	502	349	223
		Shear	4793	1843	1141	826	677	533
	SECTION DATA (a)		Fb = 1930 psi KS = .5522 in. 3/ft		E = 1,650,000 psi I = .2183 in. 4/ft		Fs = 102 psi lb/Q = 5.8342 in 2/ft	
	Face grain PARALLEL to supports	L/360	9219	1541	497	213	151	77
		L/270	12292	2055	663	283	202	103
		L/180	18438	3083	994	425	303	155
		Bending	5452	1363	606	341	189	121
		Shear	3941	1516	938	680	534	420
	SECTION DATA: (a)		Fb = 1930 psi KS = .3748 in. 3/ft		E = 1,650,000 psi I = .0937 in. 4/ft		Fs = 102 psi lb/Q = 4.7978 in. 2/ft.	
3/4" 7 PLY	Face grain PERPENDICULAR to supports	L/360	12232	2661	1036	494	300	159
		L/270	16310	3548	1381	659	400	213
		L/180	24465	5322	2072	988	600	319
		Bending	8947	2237	994	559	388	249
		Shear	5301	2039	1262	914	749	589
	SECTION DATA (a)		Fb = 1930 psi KS = .615 in. 3/ft		E = 1,650,000 psi I = .2657 in. 4/ft		Fs = 102 psi lb/Q = 6.4521 in. 2/ft	
	[redacted]	L/360	12054	2142	716	312	223	115
		L/270	16072	2855	955	416	297	153
		L/180	24108	4283	1432	624	446	230
		Bending	7322	1830	814	458	254	163
		Shear	4399	1692	1047	758	596	469
	SECTION DATA (a)		Fb = 1930 psi KS = .5033 in. 3/ft		E = 1,650,000 psi I = .1417 in. 4/ft		Fs = 102 psi lb/Q = 5.3547 in 2/ft	

(a) Fb and Fs stresses include 1.25 duration of load factor and 1.30 experience factor as recommended by American Plywood Association. E is for pure bending, as shear stiffness is calculated separately. (b) Group #1 construction. (c) Additional data available upon request.

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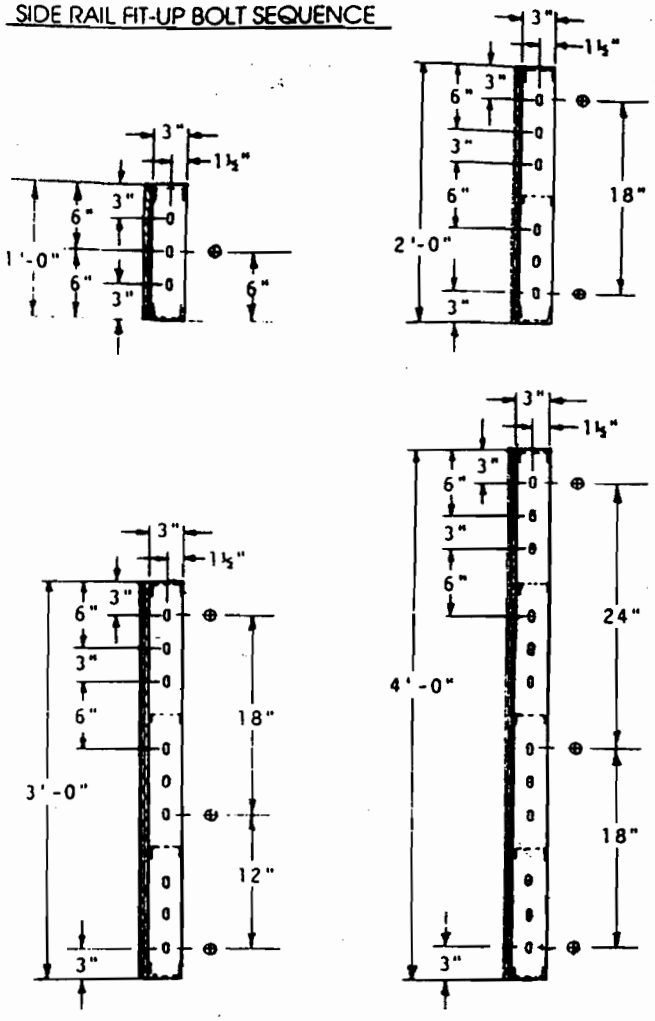
5. *Panel siderail fit-up bolt slot spacing:*
   a. Slot locations relative to each available panel size are dimensioned to the left of each sketch.
   b. Slot locations through which fit-up bolts should be installed when connecting adjacent panel siderails are dimensionally identified to the right side of each sketch.

   NOTE:Refer to Section VI for required fit-up bolt sequence for columns, outside corners, bull-nose piers or any other application where concrete pressure is not contained by wall ties or walers.

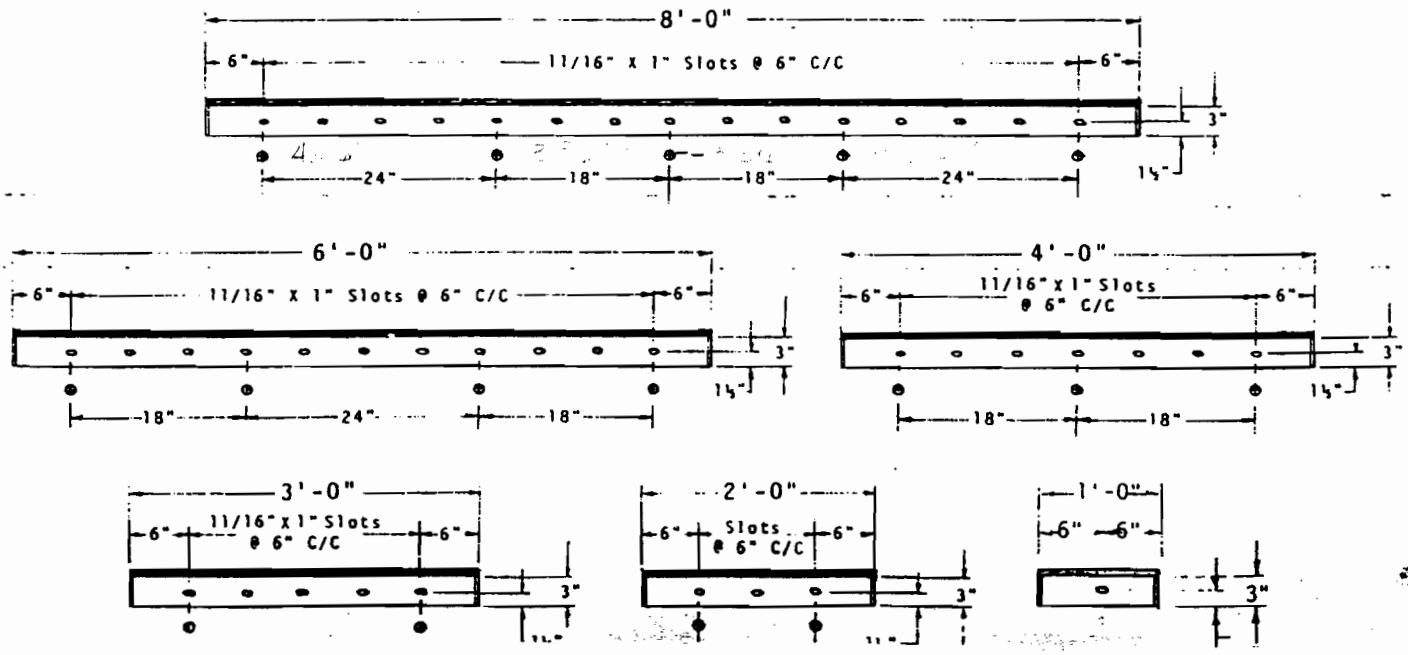
6. ⅝" x 2" Fit-up Bolts are high strength (grade 5). ⅝" x 6" contour thread long bolts are utilized for certain accessory installations and they are also high strength (grade 5).

7. *Panel Crossmember Fit-up Bolt slot spacing:*
   a. All panels should be positioned with flat side of channel crossmembers facing up, so that concrete spills do not collect in the channels and for better waler hardware connection.
   b. Fit-up Bolts should be installed at the specific slots indicated below.

SIDE RAIL FIT-UP BOLT SEQUENCE



CROSS MEMBER FIT-UP BOLT SEQUENCE



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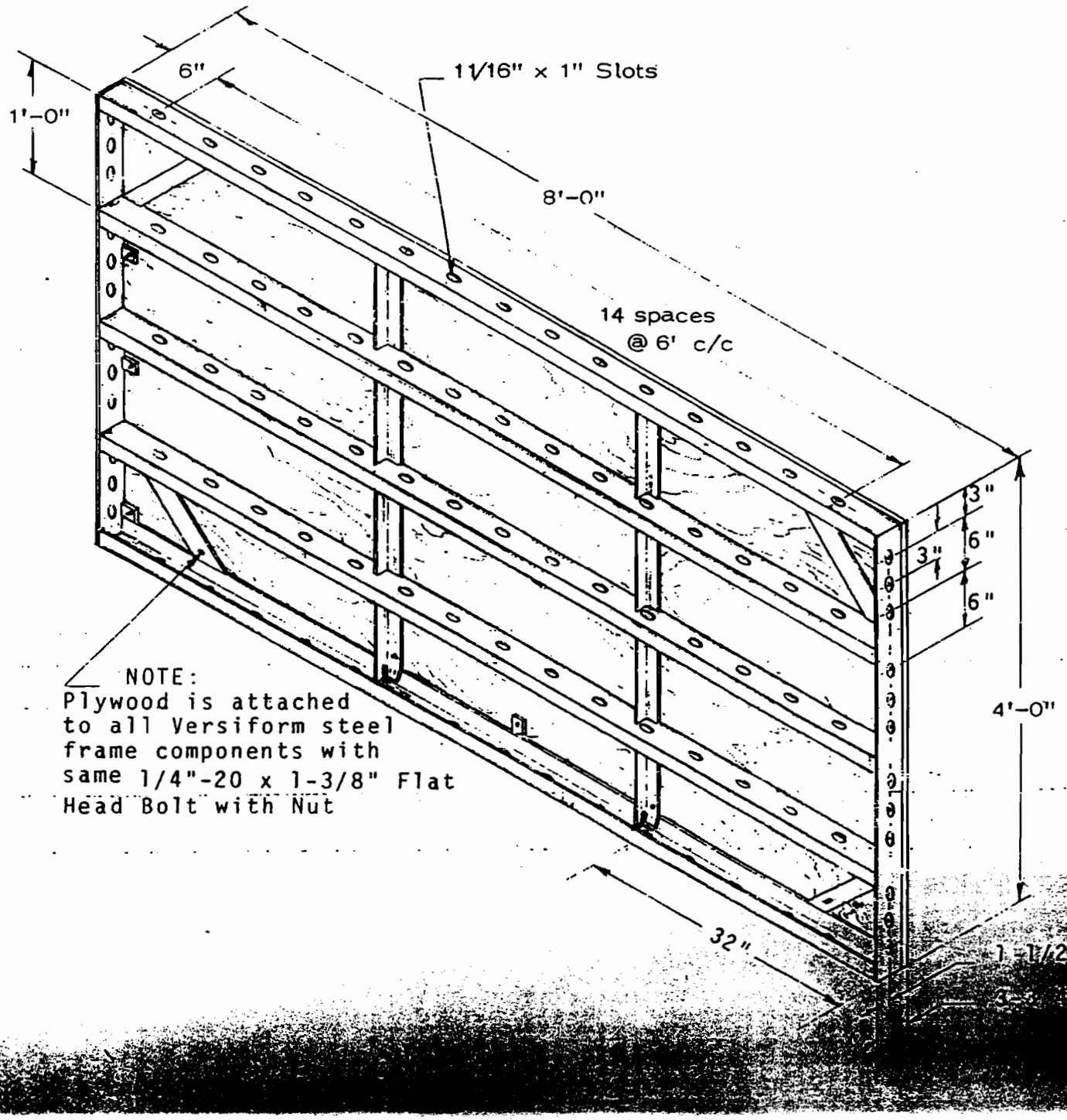
8'-0" x 4'-0" PANEL
Product Code 33084



I. INTRODUCTION

A. DEFINITION

VERSIFORM® is a 1500 PSF plywood faced steel frame modular panel forming system. The modular panels are available in a wide assortment of sizes for makeup of optimum size gang forms. Crane handled VERSIFORM® gang forms facilitate a versatile, efficient solution of forming the more massive concrete structures.

A WORD ABOUT SAFETY

High productivity depends on safety; an accident, no matter how minor, causes job delays and inefficiency, running up costs. That's why Symons Corporation, in the design of its systems and products, makes, as one of its primary concerns, the safety of those people who will be working with and near the equipment. Every product is designed with safety in mind, and is subjected to testing to be certain that it will perform as intended with appropriate safety allowances. Factory-built systems, such as these, provide predictable strengths, thereby minimizing the uncertainty that often surrounds "hand-made," "job-shop" and "job-built" equipment.

As a result, when used properly, Symons products are your best assurance of a safe operation. To insure proper use, we have published this application guide . We recommend that all construction personnel who will be involved, directly or indirectly, with the use of this product, be familiar with the contents of this guide.

As a concerned participant in the construction industry, Symons Corporation also recommends that regular safety meetings be held, prior to starting the forming operation, and regularly throughout the concrete placement and form stripping and erection operations. Symons personnel will be happy to assist in these meetings, with discussions of safe use of the equipment, and slide presentations and other formal safety information provided by such organizations as the Scaffolding, Shoring and Forming Institute.

In addition to the above meetings, all persons involved with the construction should be familiar, and in compliance, with applicable governmental regulations, codes and ordinances, as well as the industry safety standards developed and published by each of the following:

American Concrete Institute
American National Standards Institute
The Occupational Safety and Health Administration
The Scaffolding, Shoring and Forming Institute

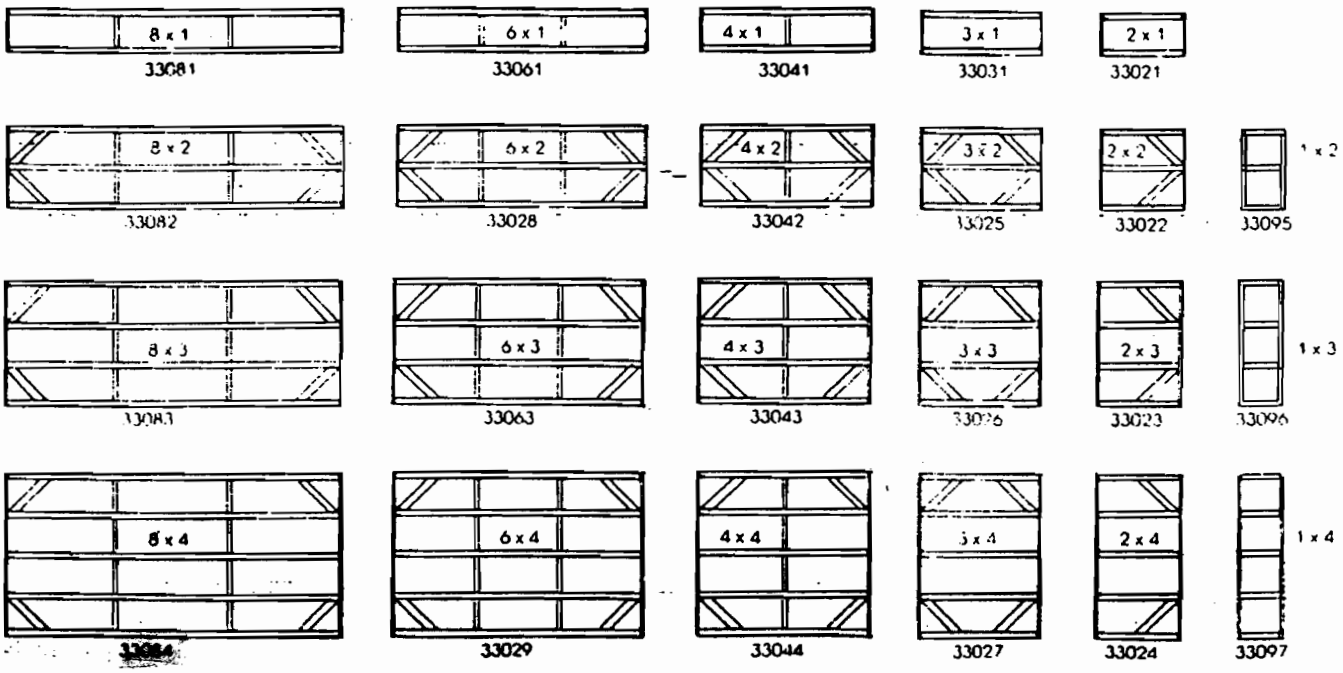
Since field conditions vary, and are beyond the knowledge and control of Symons Corporation, safe and proper use of this product is, and must be, the responsibility of the user.

II. BASIC ELEMENTS TO FABRICATE TYPICAL GANG

A. STANDARD PANELS

1. Except for *special* applications, panels are always always installed with their 3" steel channel crossmembers running the horizontal direction. The length of these crossmembers always designates the panel's width dimension.
2. Panel siderails are $\frac{3}{8}$" thick x 3" steel bars which serve as vertical joint connecting siderails. Their length always designates the panel's height dimension.
3. With $\frac{1}{4}$" thick plywood the overall form thickness is $3\frac{3}{4}$".
4. Following are the standard available VERSIFORM Panel sizes with identifying Product Code numbers:

STANDARD VERSIFORM PANELS
PRODUCT CODE NUMBERS



Heavy Formwork

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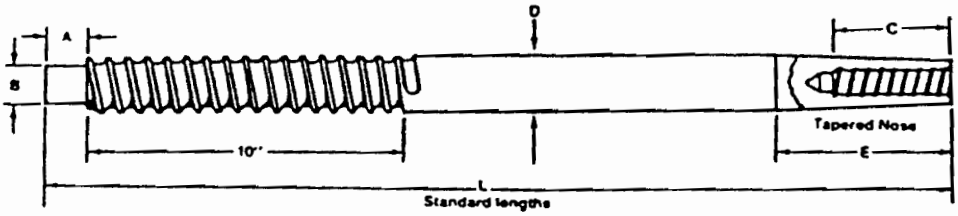
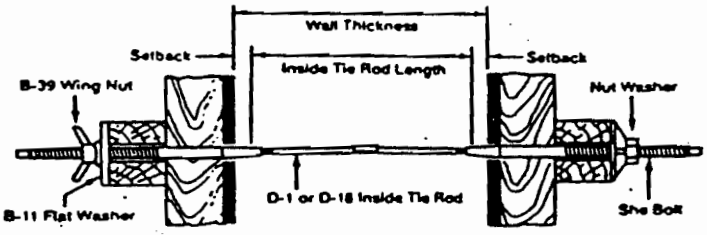
D-2 and D-30 She-Bolts

The she-bolt form tie system is one of the most versatile form hardware systems produced for use with large "crane handled" or "ganged forms." Using a nut washer or wing nut on the threaded external end of the she-bolt allows this system to be used on a wide range of different formwork thicknesses. Inexpensive expendable inside tie rods are used, allowing the she-bolt assembly to be passed through the forms after both form sides have been set in place.

She-bolts are designed to be reused—but they do wear and must be continually inspected and replaced when wear or damage is noted. A waterproof grease should be applied to that portion of the she-bolt which will be embedded into the concrete—this will facilitate the removal of the she-bolt from the hardened concrete. Special lengths are available on special order.





To Order:
Specify: (1) quantity, (2) type, (3) diameter, (4) length, (5) tapped for diameter of inside Coil or NC threaded rods.

Example:
200 pcs. D-2 She-Bolt, ¾" diameter, 20" O.A. length, tapped for ½" inside rods with Coil threads.

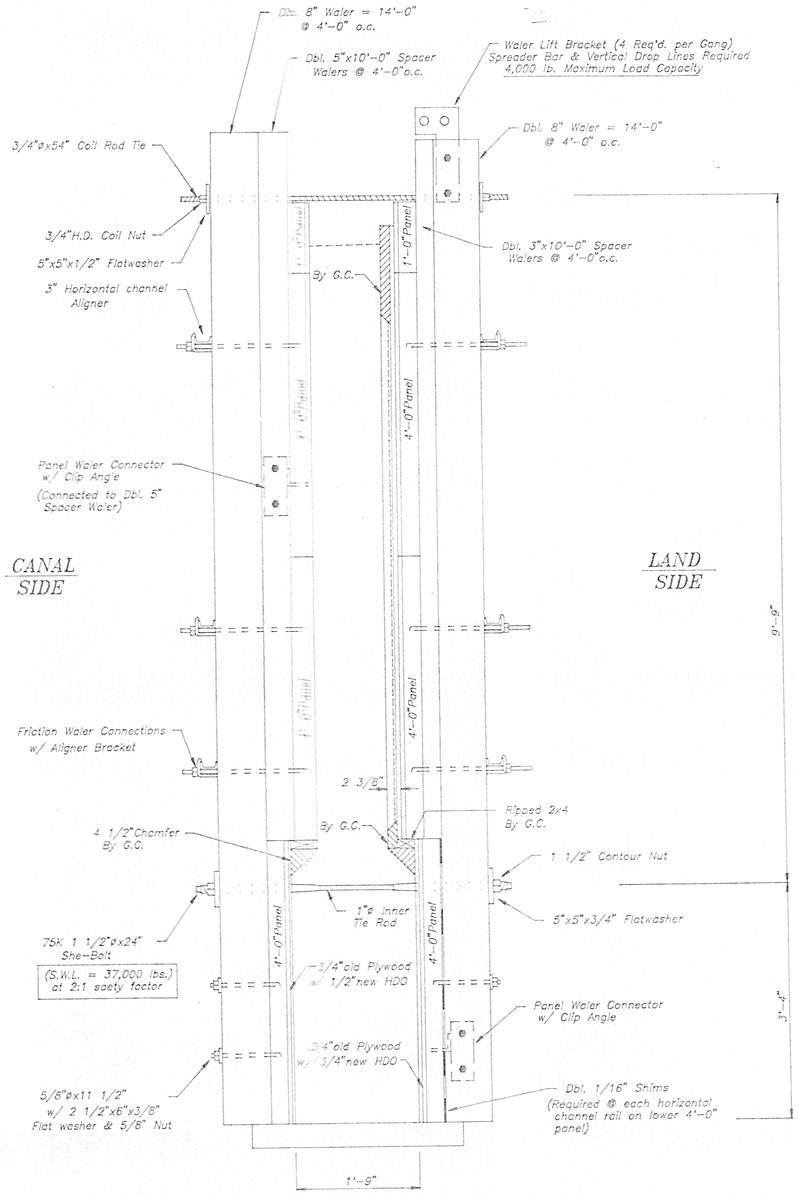
To determine correct inside rod length, subtract the required total setback (both sides) from the wall thickness.

D-2 and D-30 She-Bolt Selection Chart

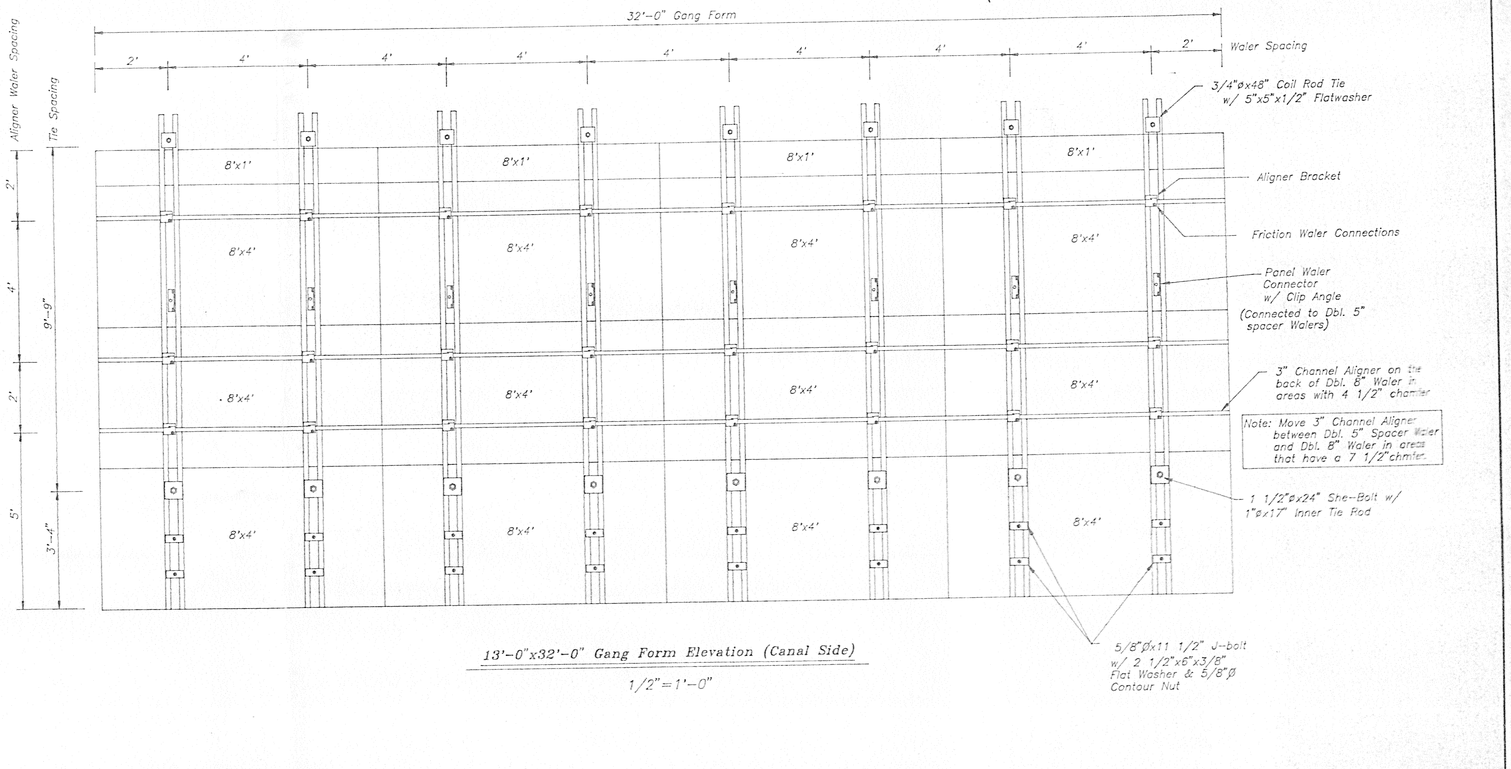
Type	Safe Working Load Tension (lbs.)	She-Bolt External Thread		Inside Tie Rod Thread		A	B	C	D	E	L	External Hardware Required
		Diameter	Type	Diameter	Type							
D-2	9,000	¾"	Acme 3½ threads/in.	½"	N.C.	¾"	½"	1¼"	¾"	3"	20"	¾" Dia. D-6
D-30	9,000	⅞"	Coil	½"	Coil	1"	½"	1½"	⅞"	2¾"	18" 20" 24"	⅞" Dia. B-27 or B-39
D-30	12,000	⅞"	Coil	½"	Coil	1"	½"	1½"	⅞"	2¾"	18" 20" 24"	⅞" Dia. B-39
D-30	18,000	1¼"	Coil	¾"	Coil	1"	¾"	2"	1¼"	4"	20" 24" 30" 35"	1¼" Dia. B-39
D-30	37,500	1½"	Coil	1"	Coil	1"	¾"	2"	1½"	4"	20" 24" 30" 35"	1½" Dia. B-39

Caution: The pitch (threads/inch) of the ¾" diameter Acme thread varies in certain geographical areas of the United States, please check before ordering.

SWL provides a factor of safety of approximately 2 to 1.



SECTION (A)
1"=1'-0"



13'-0"x32'-0" Gang Form Elevation (Canal Side)
1/2"=1'-0"

WALLFORM DESIGN
Max. Design Pressure = 1000psf

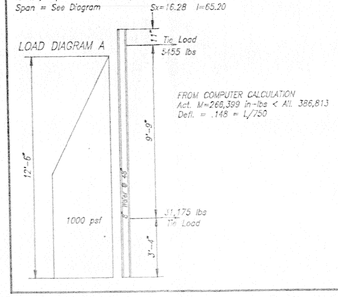
ALL LOADS CONSIDERED SHORT DURATION

3/4" HDO Plyform – Cont. Span
fb=2063psi E=1,800,000psi Allow M=941 in-lbs Allow Defl.=L/360
Clear Span = 10 1/2"
Allow Tot. Load = 1022psf > Act. 1000psf
Allow Defl. Load = 1510psf > Act. 1000psf

3" Versiform Stiffener @ 12" – Cont. Span
fb=23,760psi E=29,000,000psi Allow M=26,136 in-lbs Allow Defl.=L/360
Span = 48" (41" Clear) Sx=1.10 I=1.66
Allow Tot. Load = 1500plf > Act. 1000plf
Allow Defl. Load = 1500plf > Act. 1000plf

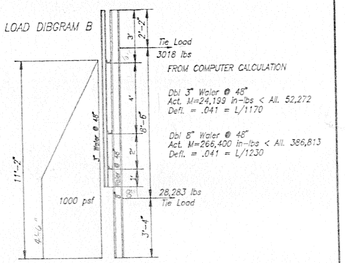
8" Versiform Waler @ 48"
fb=23,760psi E=29,000,000psi Allow M=386,813 in-lbs Allow Defl.=L/360
Span = See Diagram Sx=16.28 I=65.20

LOAD DIAGRAM A



3" Versiform Waler @ 48"
fb=23,760psi E=29,000,000psi Allow M=52,272 in-lbs Allow Defl.=L/360
Span = See Diagram Sx=2.20 I=3.32

LOAD DIBGRAM B



She-Bolt Ties
1 1/2" She-Bolts with 1" inner rods by Dayton-Superior
Allowable Load = 37,500 lbs > Actual Max Load of 31,175 lbs

MAXIMUM LATERAL PRESSURE FOR DESIGN OF WALL FORMS

Based on ACI Commitee 347 pressure formulas for placement at 10 ft per hour or less

NOTE: Do not use design pressures in excess of 150 X height of fresh concrete in forms.

Rate of placement, R, ft per hr	p,maximum lateral pressure, psf, for temperature indicated					
	90F	80F	70F	60F	50F	40F
1	250	262	278	300	330	375
2	350	375	407	450	510	600
3	450	488	536	600	690	825
4	550	600	664	750	870	1050
5	650	712	793	900	1050	1275
6	750	825	921	1050	1230	1500
7	850	938	1050	1200	1410	1725
8	881	973	1090	1246	1466	1795
9	912	1008	1130	1293	1522	1865
10	943	1043	1170	1340	1578	1935

DESIGN PRESSURE = 1000 PSF
Based on ACI Committee 347 pressure formulas

1. Unless proposal states otherwise, Formwork Services and Supply Company does not furnish wood, wood fasteners, rails, rail accessories, anchor bolts, templet bolts, tie rods, tie rod accessories, loose washers for ties and anchors or any material left in the concrete.
2. In as much as Formwork Services and Supply Company does not control job-site assembly procedures or the grade and quality of materials supplied by others, it is the responsibility of the contractor to suitably integrate this set of drawings into an overall plan consistent with the contract documents, safe practice and project objectives.
3. It is the responsibility of the contractor to verify all dimensions prior to proceeding with concrete placement.
4. This set of drawings is provided as a service to illustrate the assembly of Formwork Services and Supply Company products only. It shall remain the property of Formwork Services and Supply Company and the information shown may not be used for other than its intended purpose. This set of drawings may not be reproduced without written permission of Formwork Services and Supply Company.
5. Formwork Services and Supply Company, representative should be consulted for approval where it is necessary to deviate from recommended procedures and/or layout drawings, or when necessary to make field modification to the equipment furnished.
6. Insure that all wall ties are in place and secure as per Formwork Services and Supply Company recommendations. Do not weld, bend, or otherwise alter wall ties.
7. Formwork should be adequately braced, reanchored, otherwise secured, and stabilized against wind and other external forces prior to releasing from lifting mechanism.
8. External vibrators will not be used unless they have been considered in design of the forms and so indicated on this set of drawings.
9. DO NOT SCALE DRAWINGS.
10. All bulkheads and job-built fillers are illustrations only, and the contractor is responsible for the fabrication, placement, and structural integrity of each item.

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CUSTOMER	B & K CONSTRUCTION Co.		
JOB	FLOODWALL		
DESCRIPTION	VERSIFORM GANG FORMS		
DRAWN BY: BZ	CHECKED BY:	DATE 9-26-94	ORDER NO.
SCALE Noted	REVISION	DATE	DRAWING NO. 94069-1

1. ✓ HEAT #'S ON CASTEEL QC CERTIFICATE doesn't match METALLURGICAL LAB REPORT - how do they correspond?

2. CASTEEL'S QC REPORT (ASTM A-572 GR 50)
METALLURGICAL LAB REPORT (ASTM A-570 GR 50) p 2 A-572, Gr 50

3. * CASTEEL'S QC REPORT VANDIUM 0.002 low *
(ASTM 572-GR50 VANDIUM 0.01 - 0.15)

4. * CASTEEL'S QC REPORT COLUMBIUM 0.018 low *
(ASTM 572-GR50 COLUMBIUM .02 - .15)

5. IS METALLURGICAL LAB REPORT OF TEST THE ORIGINAL MILL TEST TAKEN WHEN STEEL WAS HOT-ROLLED? in accordance with A6

6. CASTEEL QC REPORT ONLY addresses 4 pieces of 26'-9" length C2-101

* DO WE add VANDIUM & COLUMBIUM together and check within range 0.01 - 0.16 (footnote "c")
If so their vandium+columbium is above the ASTM range 0.20

Designation: A 572/A 572M – 93

American Association State Highway and Transportation Officials Standard AASHTO No.: M223

Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Steels of Structural Quality[1]

This standard is issued under the fixed designation A 572/A 572M; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense. Consult the DoD Index of Specifications and Standards for the specific year of issue which has been adopted by the Department of Defense.

1. Scope

1.1 This specification covers four grades of high-strength low-alloy structural steel shapes, plates, sheet piling, and bars. Grades 42 [290] and 50 [345] are intended for riveted, bolted, or welded construction of bridges, buildings, and other structures. Grades 60 [415] and 65 [450] are intended for riveted or bolted construction of bridges, or for riveted, bolted, or welded construction in other applications.

1.2 For welded bridge construction notch toughness is an important requirement. For this or other applications where notch-toughness requirements are indicated, they shall be negotiated between the purchaser and the producer.

1.3 The use of columbium, vanadium, and nitrogen, or combinations thereof, within the limitations noted in Section 5, shall be at the option of the producer unless otherwise specified. Where designation of one of these elements or combination of elements is desired, reference is made to Supplementary Requirement S1 in which these elements and their common combinations are listed as to type. When such a designation is desired, both the grade and type must be specified.

1.4 The maximum thicknesses available in the grades and products covered by this specification are shown in Table 1.

1.5 When the steel is to be welded, it is presupposed that a welding procedure suitable for the grade of steel and intended use or service will be utilized.

1.6 Supplemental requirements are provided where improved internal quality and notch toughness are important. These shall apply only when specified by the purchaser on the order.

1.7 The purchaser should consider specifying supplemental requirements such as fine austenitic grain size and Charpy V-Notch Impact requirements when Group 4 or Group 5 wide flange shapes are specified for use in other than column or compression applications.

1.8 The values stated in either inch-pound units or SI units are to be regarded as standard. Within the text, the SI units are shown in brackets. The values stated in each system are not exact equivalents; therefore, each system must be used independently of the other. Combining values from the two systems may result in nonconformance with this specification.

2. Referenced Documents

2.1 *ASTM Standards:*

A 6/A 6M Specification for General Requirements for Rolled Steel Plates, Shapes, Sheet Piling, and Bars for Structural Use[2]

A 36/A 36M Specification for Structural Steel[2]

A 514/A 514M Specification for High-Yield-Strength, Quenched and Tempered Alloy Steel Plate, Suitable for Welding[2]

3. General Requirements for Delivery

3.1 Material furnished under this specification shall conform to the applicable requirements of the current edition of Specification A 6/A 6M, for the ordered material, unless a conflict exists in which case this specification shall prevail.

4. Process

4.1 The steel shall be made by one or more of the following processes: open-hearth, basic-oxygen, or electric-furnace.

4.2 Rimming-type steels shall not be used.

5. Chemical Requirements

5.1 The heat analysis shall conform to the requirements prescribed in Table 2 and in 5.3.

5.2 The steel shall conform on product analysis to the requirements prescribed in Table 2 and 5.3 subject to the product analysis tolerances in Specification A 6/A 6M.

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[1] This specification is under the jurisdiction of ASTM Committee A-1 on Steel, Stainless Steel and Related Alloys, and is the direct responsibility of Subcommittee A01.02 on Structural Steel for Bridges, Buildings, Rolling Stock, and Ships.

Current edition approved June 15, 1993. Published August 1993. Originally published as A 572 – 66. Last previous edition A 572/A 572M – 92b.

[2] *Annual Book of ASTM Standards*, Vol 01.04.

TABLE 1 Maximum Product Thickness

Grade	Yield Point, min		Maximum Thickness or Size				
	ksi	[MPa]	Plates and Bars		Structural Shapes Groups[A]	Sheet Piling	Zees and Rolled Tees
			in.	[mm]			
42 [290][B]	42	[290]	6	[150]	all	all	all
50 [345][B]	50	[345]	4	[100]	all	all	all
60 [415][B]	60	[415]	1¼	[32]	1, 2, and 3	all	all
65 [450]	65	[450]	1¼	[32]	1, 2, and 3	not available	all

[A] See Specification A 6/A 6M.

[B] In the above tabulation, Grades 42, 50, and 60 [290, 345, and 415], are the yield point levels most closely approximating a geometric progression pattern between 36 ksi [250 MPa], min, yield point steels covered by Specification A 36/A 36M and 100 ksi [690 MPa], min, yield strength steels covered by Specification A 514/A 514M.

TABLE 2 Chemical Requirements[A]
(Heat Analysis)

Diameter Thickness, or Distance Between Parallel Faces, in. [mm] Plates and Bars	Structural Shapes Groups[B]	Grade	Carbon, max, %	Manganese,[C] max, %	Phosphorus, max, %	Sulfur, max, %	Silicon[D]	
							Plates to 1½-in. [40-mm] Thick, Shapes to 426 lb/ft [634 kg/m], Sheet Piling, Bars, Zees, and Rolled Tees[E]	Plates Over 1½-in. [40-mm] Thick and Shapes Over 426 lb/ft [634 kg/m]
							max, %	range, %
6 [150]	all	42 [290]	0.21	1.35[G]	0.04	0.05	0.40	0.15–0.40
4 [100]	all	50 [345]	0.23	1.35[G]	0.04	0.05	0.40	0.15–0.40
1¼ [32]	1,2,3	60 [415]	0.26	1.35[G]	0.04	0.05	0.40	...
>½–1¼ [13–32]	2,3	65 [450]	0.23	1.65	0.04	0.05	0.40	...
≤½ [13][F]	1[F]	65 [450]	0.26	1.35	0.04	0.05	0.40	...

[A] Copper when specified shall have a minimum content of 0.20 % by heat analysis (0.18 % product analysis).

[B] See Specification A6/A6M.

[C] Manganese, minimum by heat analysis of 0.80 % (0.75 % product analysis) shall be required for all plates over ⅜ in. [10 mm] in thickness; a minimum of 0.50 % (0.45 % product analysis) shall be required for plates ⅜ in. [10 mm] and less in thickness, and for all other products. The manganese to carbon ratio shall not be less than 2 to 1.

[D] Silicon content in excess of 0.40 % by heat analysis must be negotiated.

[E] Bars over 1½ in. [40 mm] in diameter, thickness, or distance between parallel faces, shall be made by a killed steel practice.

[F] An alternative chemical requirement with a maximum carbon of 0.21 % and a maximum manganese of 1.65 % is permissible with the balance of the elements as shown in Table 2.

[G] A maximum of manganese of 1.50 % is permissible, with an associated reduction of the carbon maximum of 0.03 %.

5.3 Alloy content shall be in accordance with one of the following types:

Elements	Heat Analysis, %
Type 1—Columbium[A]	0.005–0.05[B]
Type 2—Vanadium	0.01–0.15
Type 3—Columbium[C] (0.05 max, %) plus vanadium[C]	0.02–0.15
Type 4—Nitrogen[D] (with vanadium)	0.015 max

[A] Columbium when added either singly or in combination with vanadium shall be restricted to the following unless killed steel is furnished:

Grades	Maximum Plate, Bar, Sheet Piling, Zees, and Rolled Tee Thicknesses, in. [mm]	Structural Shape Size Groupings (Specification A 6/A 6M, Table A)
42 and 50 [290 and 345]	¾ [20]	Groups 1 and 2
60 and 65 [415 and 450]	½ [13]	Groups 1 and 2 Group 1 Group 1

[B] Product analysis limits = 0.004–0.060 %.

[C] Product analysis limits = 0.01 to 0.16 when columbium and vanadium are used in combination.

[D] Nitrogen (0.015 max %) when added as a supplement to vanadium shall be reported, and the minimum ratio of vanadium to nitrogen shall be 4 to 1.

6. Mechanical Requirements

6.1 *Tensile Properties:*

6.1.1 The material as represented by the test specimens shall conform to the tensile properties given in Table 3.

TABLE 3 Tensile Requirements [A]

Grade	Yield Point, min		Tensile Strength, min		Minimum Elongation, [B,C,D]	
	ksi	[MPa]	ksi	[MPa]	in 8 in. [200 mm]	in 2 in. [50 mm]
42 [290]	42	[290]	60	[415]	20	24
50 [345]	50	[345]	65	[450]	18	21
60 [415]	60	[415]	75	[520]	16	18
65 [450]	65	[450]	80	[550]	15	17

[A] See specimen Orientation under the Tension Tests section of Specification A 6/A 6M.

[B] Elongation not required to be determined for floor plate.

[C] For wide flange shapes over 426 lb/ft [634 kg/m] elongation in 2 in. [50 mm] of 19 % minimum applies.

[D] For plates wider than 24 in. [600 mm], the elongation requirement is reduced two percentage points for Grades 42 and 50 [290 and 345], and three percentage points for Grades 60 and 65 [415 and 450]. See elongation requirement adjustments in the Tension Tests section of Specification A 6/A 6M.

SUPPLEMENTARY REQUIREMENTS

The following supplementary requirement shall apply when specified in the order or contract:

S81. Tensile Strength

S81.1 For Grade 50 steel of thicknesses ¾-in. [20 mm] and under, the tensile strength shall be a minimum of 70 ksi [485 MPa].

S90. Types

S90.1 When a purchaser prefers to designate the specific elements (columbium, vanadium, nitrogen, or combinations thereof), one of the types listed below shall be specified. The type in addition to the grade must be shown on the order.

Type 1—Columbium
Type 2—Vanadium
Type 3—Columbium and vanadium
Type 4—Vanadium and nitrogen

S90.2 The composition limits of Section 5 shall apply for any of these types.

S91. Fine Austenitic Grain Size

S91.1 The steel shall be killed with a fine austenitic grain size.

Standardized supplementary requirements for use at the option of the purchaser are listed in Specification A 6/A 6M. Those that are considered suitable for use with this specification are listed by title:

S5. Charpy V-Notch Impact Test.
S14. Bend Test.
S18. Maximum Tensile Strength.

METALLURGICAL LABORATORY
REPORT OF TEST

WEIRTON STEEL CORPORATION
WEIRTON, WEST VIRGINIA 26062

NOV 18 1994

INDEX : 002764
MILL ORDER : 002764-003 CONSTRUCTION CO., INC.
BUYER'S NO : 1050
ITEM NO : 01
CUST SPEC : ASTM A 570 GRADE 50

MODE: BARGE DATE: 09/23/94

SOLD TO: 20016
THE CASTEEL GROUP INC.
ROUTE 1, BOX 374A
BELPRE, OHIO 45714

SHIP TO: 20248
THE CASTEEL GROUP INC
C/O MARIETTA INDUSTRIAL ENTERPRS.
MILE 179 ON OHIO RIVER
MARIETTA, OHIO 45750

EHICLE ID: NM324 ROUTE/CARRIER: NM

RODUCT:
ASQ-50 HOT ROLLED STEEL SHEETS NON-TEMPERPASSED

PM UMBER	HEAT NUMBER	YIELD STRENGTH LBS/ SQ. IN. (50,000)	ULTIMATE STRENGTH LBS/ SQ. IN. (65,000)	PER CENT ELONGATION IN 2 INS. (21%)	CTG WGT OZ. PER SQ. FT.	RW. B.	BENDS
395418	78335	56,800	75,700	32.5			
395421	78335	56,800	75,700	32.5			
395422	78335	56,800	75,700	32.5			
395430	78335	56,800	75,700	32.5			
395431	78341	62,800	78,500	33.5			
395435	78337	57,900	71,900	31.5			
395444	78336	60,700	73,400	32.0			
397413	78519	60,600	74,700	34.0			
397415	78519	60,600	74,700	34.0			
397420	78518	59,300	75,000	33.0			
397421	78518	59,300	75,000	33.0			
397422	78518	59,300	75,000	33.0			
399090	78518	59,300	75,000	33.0			

C H E M I C A L A N A L Y S I S (.23 / 1.35 / .05 / .04 / .4)

HEAT	C/MO	MN/AL	S/ZR	P/V	SI/CB	SN/TI	CU/B	CR/OPPM	NI/NPP
78335	.160	.65	.008	.008	.014	.002	.023	.017	.023
	.009	.052	NT	.002	.018	NT	NT	26	6c
78336	.160	.67	.007	.008	.013	.002	.018	.016	.022
	.008	.040	NT	.002	.020	NT	NT	24	5c
78337	.160	.71	.007	.008	.012	.006	.024	.018	.025
	.007	.039	NT	.002	.022	NT	NT	24	5:
78341	.160	.71	.009	.009	.010	.002	.024	.024	.024
	.008	.036	NT	.002	.020	NT	NT	25	45
78518	.140	.73	.007	.011	.014	.002	.012	.021	.01-
	.004	.049	NT	.002	.023	NT	NT	26	4:
78519	.150	.74	.008	.011	.012	.003	.022	.025	.01:
	.005	.030	NT	.003	.020	.001	NT	28	4:

THIS IS TO CERTIFY THE ABOVE TESTS ARE TRUE AS CONTAINED IN THE COMPANY RECORDS.

SIGNED Dan Daf METALLURGIST

NOTE: "NT" SIGNIFIES "NOT TESTED".

THE ABOVE STEEL CONFORMS TO THE PILING SPEC A-572 GRADE 50.
(HIGH STRENGTH LOW-ALLOY COLUMBIUM-VANADIUM STEELS OF STRUCTURAL QUALITY)

BY: George E. Lehr 11/17/94
WEIRTON STEEL CORP. DATE

B & K

NOV 1 8 1994

CONSTRUCTION CO., INC.

Castēel

WHERE IT ALL BEGINS

The Casteel Group, Inc.

QUALITY CONTROL CERTIFICATE

Plant
Rt. 1, Box 374-A
Belpre, Ohio U.S.A.
45714

Tel: (614) 423-8544
Fax: (614) 423-8541

Date November 17, 1994

Customer

SKYLINE STEEL CORPORATION
11550 FUQUA, SUITE 345
HOUSTON, TX 77034

PROJECT: London Avenue
Outfall Canal
Orleans Parish, LA

Specification Description

NEW STEEL SHEET PILING
ASTM A 572, GR. 50
CZ101

HEAT NUMBERS WERE PRINTED ON ENDS OF PILING BY THE MILL

Bill(s) of Lading

Purchase Order

Your P.O. 487592
Our W.O. 95-044
Ship to: CPU

Heat No.	TENSILE TEST Yield Point Psi 50,000	Tensile Strength Psi 65,000	% Elongation 8 in ☐ 2 in ☒	# of PCS.	# of FT.	CHEMICAL ANALYSIS C .23 max	Mn 1.35 max	P .04 max	S .05 max	Si .4 max	Cu	Ni	Cr	V .01-.15	CB .02-.15 .05 max
92669	55000 ***	71300	35.5 ✓	25	26.75	0.15	0.70	0.010	.007	.010	.022	.021	.018	.002	.022
92672	56800 ***	75700	32.5 ✓	21	26.75	0.16	0.65	0.008	.008	.014	.023	.023	.017	.002	.018

min 21%

.01-.16 together footnote "C"

*** MANUFACTURED IN THE U.S.A. ***

We hereby certify that the material described has been tested in accordance with specification and that the results are correct as contained in the records of the Company. We also certify that the chemical (heat) analysis recorded herein is as certified by the steel producer.

By Jim Perine
JIM PERINE

/np

ROUTING OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, MANUFACTURER'S CERTIFICATES OF COMPLIANCE FOR APPROVAL

(Used to route ENG Form 4025 with items attached. Not to become a part of the Contractor's record.)

	TO:	FROM:	DATE
1	C/Const Div	Area Engr, New Orleans	10/18/94

The attached items listed on ENG Form 4025 are forwarded for approval action.

CONTRACT NUMBER	CONTRACTOR
94-C-0079	B & K Const Co., Inc.
TRANSMITTAL NUMBERS #26	**PROJECT TITLE AND LOCATION**
Siphon & telephone conduit details	London Ave Canal - Mirabeau to Lake C. S. mon.

COMMENTS *(Attach additional sheet, if necessary)*

Request your office review the attached telephone conduit & siphon details ~~submittals~~ submittals for the subject contract. Furnish any comments to NOAD by COB 1 Nov 94. POC is Chris Wagner x1222

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
1	DANNIS DUHON, Supv Civ Engr	Dennis Duhon

	TO:	FROM:	DATE
2	C/Engr Div	C/Const Div	10/19/94

COMMENTS *(Attach additional sheet, if necessary)*

Pls review & Cmt by COB 10/31/94

COB is Jim Berry X 1240

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
	RICHARD T. HILL	Richard T. Hill

	TO:	FROM:	DATE
3	C/Const Div	C/Engr Div	11/16/94

COMMENTS *(Attach additional sheet, if necessary)*

Not recommended for approval.

See attached comments.

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
2	W. Eugene Tickner C/Engr Div	

	TO:	FROM:	DATE
4			

The following action codes are given to items listed on ENG Form 4025:

ACTION CODES

A - APPROVED AS SUBMITTED.

B - APPROVED, EXCEPT AS NOTED ON DRAWINGS. RESUBMISSION NOT REQUIRED.

C - APPROVED, EXCEPT AS NOTED ON DRAWINGS. REFER TO ATTACHED SHEET. RESUBMISSION REQUIRED.

D - WILL BE RETURNED BY SEPARATE CORRESPONDENCE.

E - DISAPPROVED (SEE ATTACHED)

F - RECEIPT ACKNOWLEDGED

G - OTHER *(specify)*

ACTION CODES TO BE INSERTED IN COLUMN G, SECTION I, ENG FORM 4025 *(Attach sheets, when required.)*

ITEM NO. *(Taken from ENG Form 4025)*								
CODE GIVEN								

REMARKS

OCT 19 1994

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE

ENG FORM 1 NOV 74 4026 EDITION OF NOV 66 MAY BE USED.

*U.S. G.P.O. 1982-521-246/393

Siphon & Cable Crossing Submittal

1. Manufab Dwg. F-727-5.

a. Note 4. Expansion anchors shall conform to Fed. Spec. FF-S-385, Group II, Type 4, Class 1.

b. Erection Detail, Elevation. B&K needs to furnish to Manufab the elevation & angle of the steel conduit.

c. Erection Detail, View B-B. The 2" typical dimension for bolt spacing should be 2-1/2". This increases the distance between the bolt hole and the miter splice on the L-type waterstop. The dimensions of "2 - Seal Retainer Bars F5" need to be changed accordingly.

d. Erection Detail, Section D-D.

(1) By a forthcoming modification, we are adding steel shims between the pipe sleeve and L-type waterstop. See the shop drawings for a sketch. This will provide a better seal between the two.

(2) Please verify that the embedment length of the anchor bolts conforms to the manufacturer's minimum requirements. Our catalogs indicate that for a 1/2" bolt, the minimum embedment is 2 1/4" which is greater than shown.

d. 1 - Telephone Cable Tray A5, End View. Please verify that the 3'-10 3/8" dimension is an "out to out" measurement.

2. Manufab Dwg. F-727-6.

a. Note 3. Expansion anchors shall conform to Fed. Spec. FF-S-385, Group II, Type 4, Class 1.

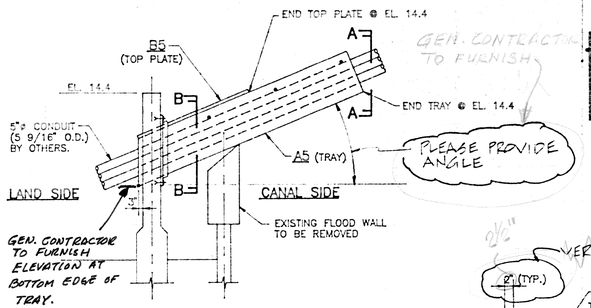
b. Erection Detail. B&K should field verify the outer diameter and elevation of both pipes.

c. Section A-A. Please verify that the embedment length of the anchor bolts conforms to the manufacturer's minimum requirements. Our catalogs indicate that for a 1/4" bolt, the minimum embedment is 1 1/2" which is greater than shown.

3. Manufab Dwg. F-727-7.

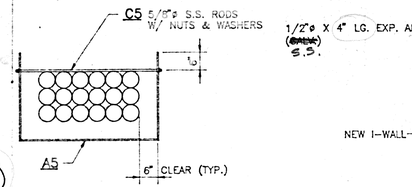
a. Feeder Line 340 & 422 thru Sheet Piling. B&K should provide the outer diameter of feeder lines FL-340 and FL-422 to Manufab.

b. Installation Detail. The Contractor should be aware that the pipe sleeve shall be completely welded to the sheet piling on both sides regardless of the sheet pile configuration.

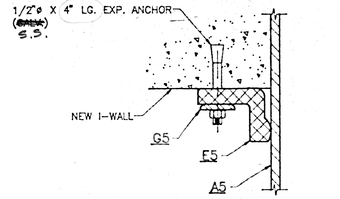


ELEVATION

ERECTION DETAIL
NO SCALE

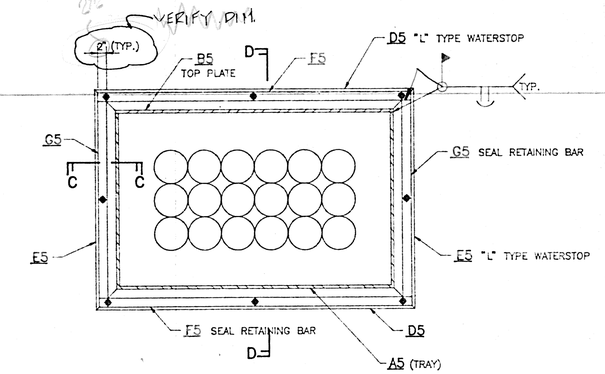


VIEW "A-A"

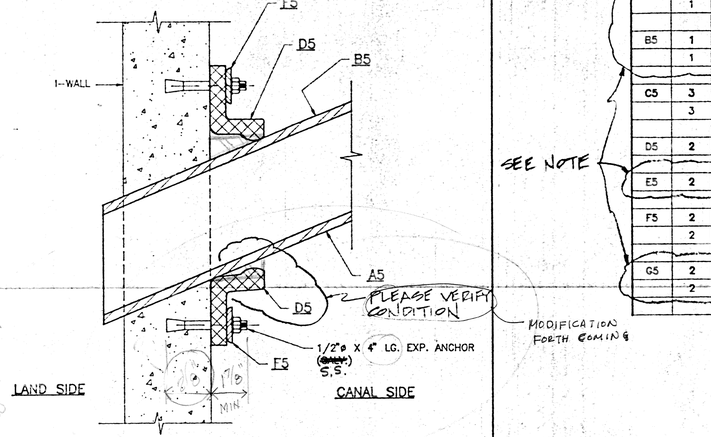


NOTE:
SET "L" TYPE WATERSTOP FOR 1/8" DEFLECTION (TYP.)

SECTION "C-C"



VIEW "B-B"



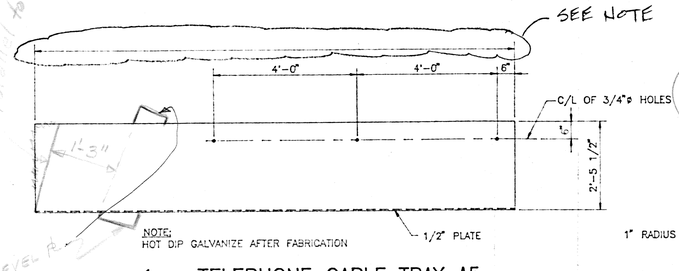
SECTION "D-D"

BILL OF MATERIAL					F-727-5
MARK	QTY	DESCRIPTION	FT	IN	REMARKS
A5	1	TELEPHONE CABLE TRAY			SEE DETAIL
	1	PLATE 1/2 X 8'-9 3/8			H. D. GALV.
B5	1	TOP PLATE (SHIP LOOSE)			NO DETAIL
	1	PLATE 1/2 X 3'-10 3/8			H. D. GALV.
C5	3	HANGER BOLTS			SEE DETAIL
	3	5/8"ø ROD W/ 2 NUTS & 2 F.W.	4	0 1/2	C.R.S.
D5	2	"L" TYPE WATER STOP	4	6 3/4	SEE DETAIL
E5	2	"L" TYPE WATER STOP			SEE DETAIL
F5	2	SEAL RETAINING BARS			SEE DETAIL
	2	FB 5/16" X 2	4	6 1/2	C.R.S.
G5	2	SEAL RETAINING BARS			SEE DETAIL
	2	FB 5/16" X 2			C.R.S.

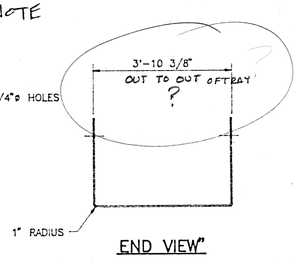
SEE NOTE

HARDWARE
8 - 1/2"ø X 4" LG. EXPANSION ANCHORS (S.S.)

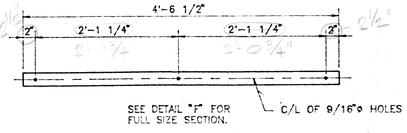
NOTE:
LENGTH OF MATERIALS @ CLOUDED AREAS TO BE DETERMINED.



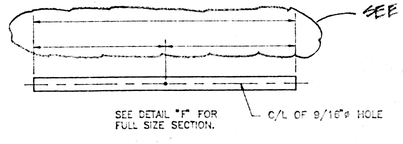
1 - TELEPHONE CABLE TRAY A5



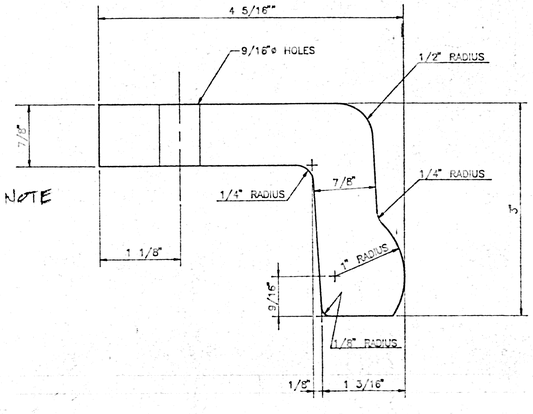
END VIEW"



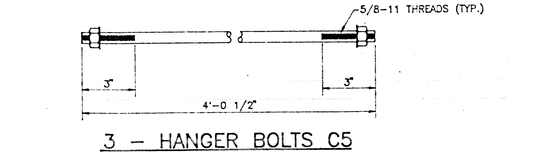
2 - SEAL RETAINER BARS F5



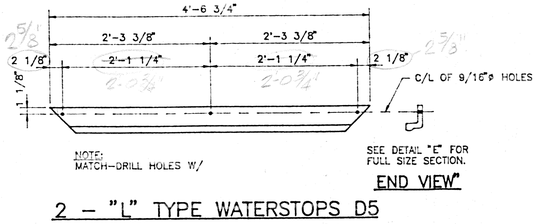
2 - SEAL RETAINER BARS G5



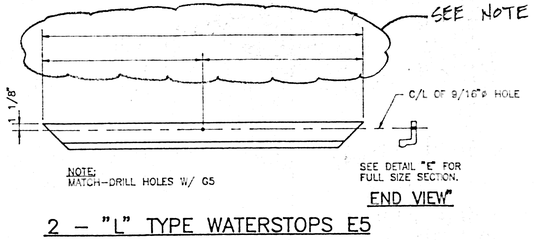
E DETAIL - "L" TYPE WATERSTOP
FULL SIZE



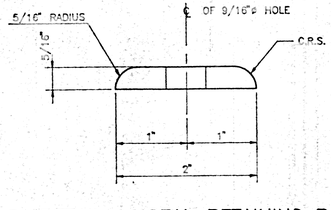
3 - HANGER BOLTS C5



2 - "L" TYPE WATERSTOPS D5



2 - "L" TYPE WATERSTOPS E5



F DETAIL - SEAL RETAINING BAR
FULL SIZE

NOTES:
1. GALV.: AS PER ASTM A123.
2. STEEL: ASTM A36.
3. WELD: AWS D1.1 USING E70XX ELECTRODES.
4. EXPANSION ANCHORS: TYPE 304
5. "L" TYPE WATERSTOP: SHALL CONFORM TO CRD-C 513
6. SEAL RETAINING BARS: TYPE 304

CORPS OF ENGINEERS CONTRACT NO. DACW29-94-B-0047

MANUFAB Kenner, La.

LONDON AVE. OUTFALL CANAL, PARALLEL PROTECTION
MIRABEAU AVE. TO ROBERT E. LEE BLVD., WEST BANK
MIRABEAU AVE. TO LEON C. SIMON BLVD., EAST BANK

SCALE: AS NOTED	APPROVED BY:	DRAWN BY: LM
DATE: 9/94		

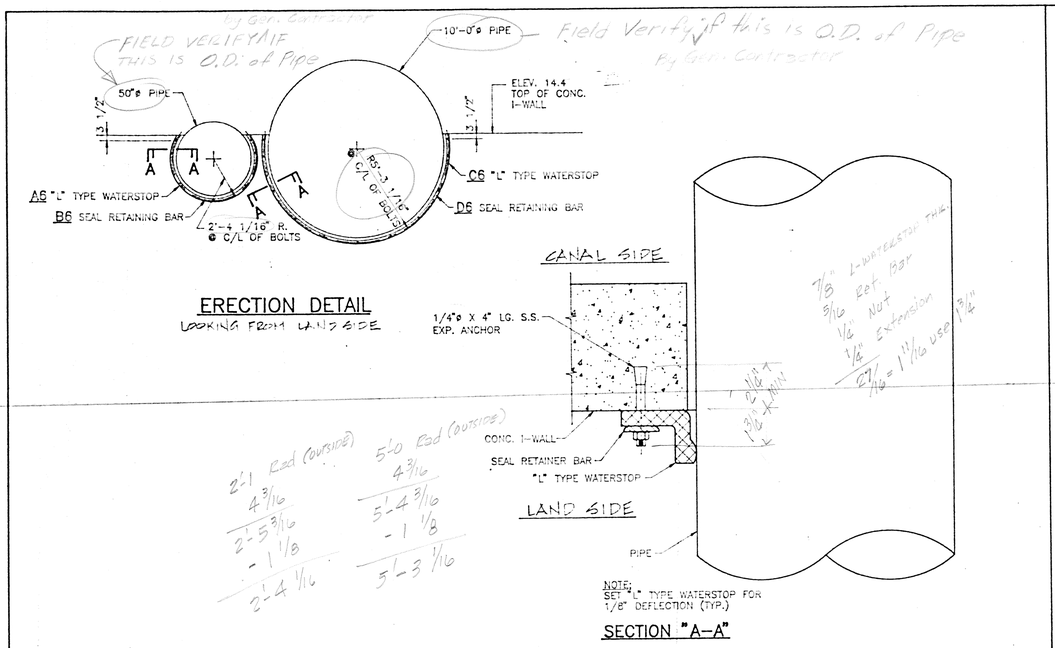
GENERAL CONTRACTOR: B & K CONSTRUCTION, MANDEVILLE, LA.
CONSULTING ENG.: U.S. ARMY ENGINEER DISTRICT, N.O., LA.

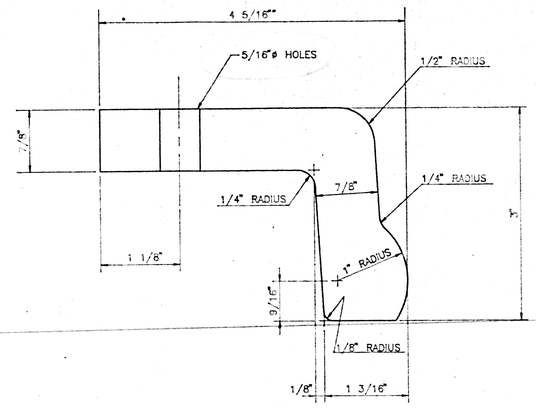
TELEPHONE CABLE TRAY W/ SEALS & RETAINING BARS

DRAWING NUMBER: F-727-5

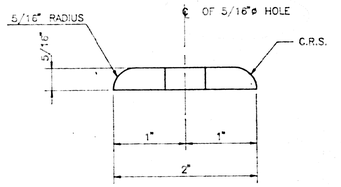
$$1\frac{3}{8} + 1\frac{1}{4} = 2\frac{7}{8}$$

$$4\frac{1}{2} + 1\frac{3}{4} = 2\frac{3}{4}$$





SECTION "B-B" – "L" TYPE WATERSTOP
FULL SIZE

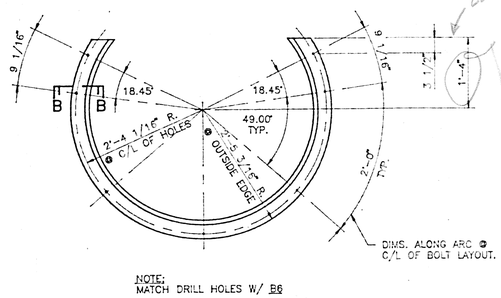


SECTION "C-C" – SEAL RETAINING BAR
FULL SIZE

BILL OF MATERIAL					F-727-6
MARK	QTY	DESCRIPTION	FT	IN	REMARKS
A6	1	"L" TYPE WATERSTOP	11	0 1/4	SEE DETAIL
B6	1	SEAL RETAINING BAR			SEE DETAIL
	1	S.S. FB 5/16 X 2	10	8 3/8	C.R.S.
C6	1	"L" TYPE WATERSTOP	18	7 3/16	SEE DETAIL
D6	1	SEAL RETAINING BAR			SEE DETAIL
	1	S.S. FB 5/16 X 2	18	6	C.R.S.

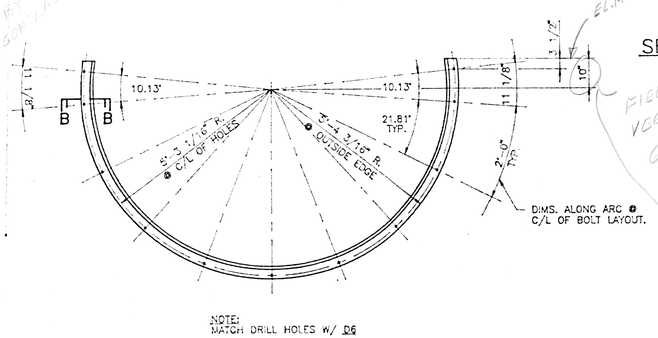
HARDWARE
18 – 1/4"ø X 4" LG. EXPANSION ANCHORS (S.S.)

CHECK WITH SURESH IF OK
Suresh said OK 11/9/94



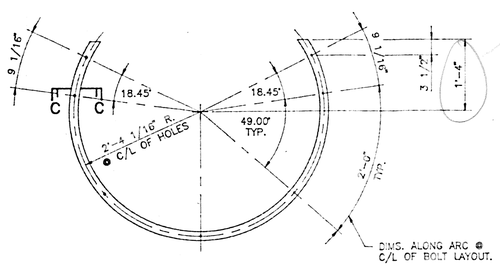
NOTE:
MATCH DRILL HOLES W/ B6

1 – "L" TYPE WATERSTOP A6
NO SCALE

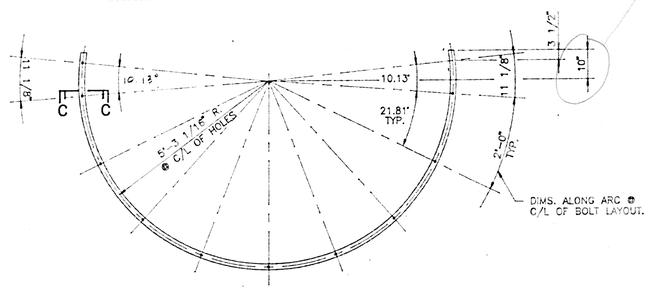


NOTE:
MATCH DRILL HOLES W/ D6

1 – "L" TYPE WATERSTOP C6
NO SCALE



1 – SEAL RETAINER BAR B6
NO SCALE



1 – SEAL RETAINER BAR D6
NO SCALE

NOTES:
1. "L" TYPE WATERSTOPS: SHALL CONFORM TO CRD-C 513.
2. SEAL RETAINING BARS: TYPE 304.
3. S.S EXPANSION ANCHORS: TYPE 304.

Fed. Spec. FF-S-325, GROUP II, TYPE 4, CLASS 1

CORPS OF ENGINEERS CONTRACT
NO. DACW29-94-B-0047

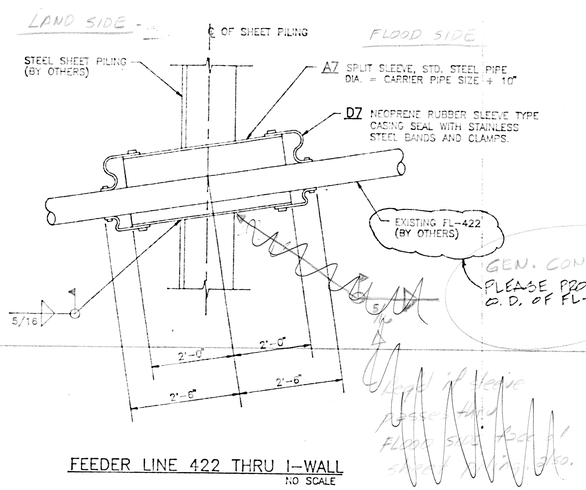
MANUFAB Kenner, La.

LONDON AVE. OUTFALL CANAL, PARALLEL PROTECTION
MIRABEAU AVE. TO ROBERT E. LEE BLVD., WEST BANK
MIRABEAU AVE. TO LEON C. SIMON BLVD., EAST BANK

SCALE: AS NOTED	APPROVED BY	DRAWN BY: LM
DATE: 9/94		

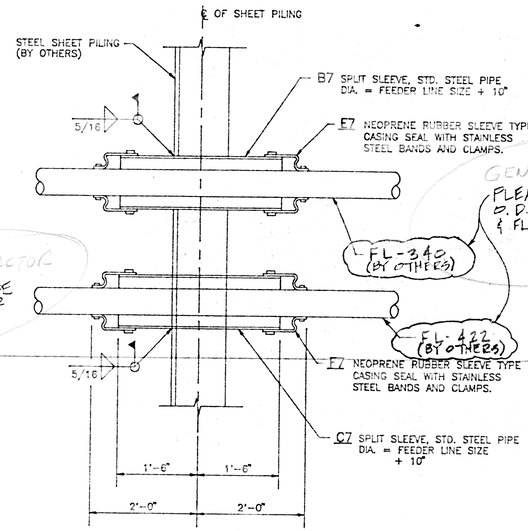
GENERAL CONTRACTOR: B & K CONSTRUCTION, MANDEVILLE, LA.
CONSULTING ENG.: U.S. ARMY ENGINEER DISTRICT, N.O., LA.

SEALS & RETAINING BARS ℄ SIPHON PIPES | DRAWING NUMBER F-727-6



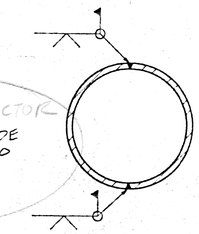
FEEDER LINE 422 THRU I-WALL
NO SCALE

LOCATE AT: APPR. STA. 101+38.90 WB/L



FEEDER LINE 340 & 422 THRU SHEET PILING
NO SCALE

LOCATE AT: APPR. STA. 100+04.79 EB/L



TYPICAL SPLIT SLEEVE DETAIL

SIZE TO BE DETERMINED

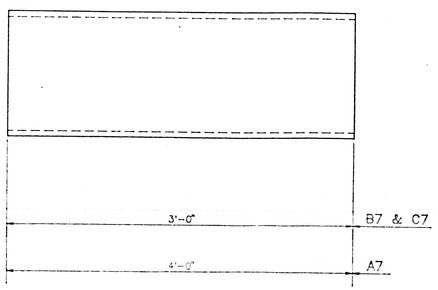
BILL OF MATERIAL

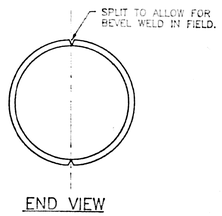
F-727-7

MARK	QTY	DESCRIPTION	FT	IN	REMARKS
A7	1	STEEL SLEEVE			SEE DETAIL
	1	STD. STEEL PIPE	4	0	GALV.
B7	1	STEEL SLEEVE			SEE DETAIL
	1	STD. STEEL PIPE	3	0	GALV.
C7	1	STEEL SLEEVE			SEE DETAIL
	1	STD. STEEL PIPE	3	0	GALV.
D7	1	NEOPRENE RUBBER CASING SEAL W/ S.S. BANDS AND CLAMPS			NO DETAIL
E7	1	NEOPRENE RUBBER CASING SEAL W/ S.S. BANDS AND CLAMPS			NO DETAIL
F7	1	NEOPRENE RUBBER CASING SEAL W/ S.S. BANDS AND CLAMPS			NO DETAIL

INSTALLATION DETAIL

RE: CONTRACT DWG. NO. 39 FOR INFO NOT SHOWN





END VIEW

1 SPLIT SLEEVE A7
1 SPLIT SLEEVE B7
1 SPLIT SLEEVE C7

NOTES:
1. GALV.: AS PER ASTM A123.
2. STEEL PIPE: ASTM A53.

CORPS OF ENGINEERS CONTRACT NO. DACW29-94-B-0047

MANUFAB Kenner, La.

LONDON AVE. OUTFALL CANAL, PARALLEL PROTECTION
MIRABEAU AVE. TO ROBERT E. LEE BLVD., WEST BANK
MIRABEAU AVE. TO LEON C. SIMON BLVD., EAST BANK

SCALE: AS NOTED	APPROVED BY	DRAWN BY: LM
DATE: 9/94		

GENERAL CONTRACTOR: B & K CONSTRUCTION, MANDEVILLE, LA.
CONSULTING ENG.: U.S. ARMY ENGINEER DISTRICT, N.O., LA.

SPLIT SLEEVES & NEOPRENE SEALS

DRAWING NUMBER F-727-7

ROUTING OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, MANUFACTURER'S CERTIFICATES OF COMPLIANCE FOR APPROVAL

(Used to route ENG Form 4025 with items attached. Not to become a part of the Contractor's record.)

	TO:	FROM:	DATE
1	C/Const Div	A/E, New Orleans	10/6/94

The attached items listed on ENG Form 4025 are forwarded for approval action.

CONTRACT NUMBER	CONTRACTOR
94-C-0079	B+K Const Co, Inc
TRANSMITTAL NUMBERS #23 - Temporary access rd, ramp & retaining wall calculations	**PROJECT TITLE AND LOCATION** London Ave Canal Flood Mirabeau to Leon C. Simon Blvd.

COMMENTS (Attach additional sheet, if necessary)
Request your office review the attached submittal & furnish your comments to NOAO by COB 17 Oct 94. POC is Chris Wagner, x122

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
1	Dennis Duhon, Supv Civ Engr	

	TO:	FROM:	DATE
2	C/Engr Div	C/Const. Div	10/11/94

COMMENTS (Attach additional sheet, if necessary)
Pls. review & cmt by ~~COB~~ Noon 17 Oct 94
POC Jim Berry x 1240

FILE COPY

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
	RICHARD T. HILL	

	TO:	FROM:	DATE
3	C/Const Div	C/Engr Div	10/26/94

COMMENTS (Attach additional sheet, if necessary)
Recommend approving the configuration with the tip elev. at -22.5 NGVD. This is based on the attached calculations dtd 10/24/94 & faxed on 10/25/94. We do not recommend approving the configuration with the tip of elev. at -18.5 NGVD.

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
2 Encls	W. Eugene Tickner	

	TO:	FROM:	DATE
4			

The following action codes are given to items listed on ENG Form 4025:

ACTION CODES

A - APPROVED AS SUBMITTED.
B - APPROVED, EXCEPT AS NOTED ON DRAWINGS. RESUBMISSION NOT REQUIRED.
C - APPROVED, EXCEPT AS NOTED ON DRAWINGS. REFER TO ATTACHED SHEET. RESUBMISSION REQUIRED.
D - WILL BE RETURNED BY SEPARATE CORRESPONDENCE.
E - DISAPPROVED (SEE ATTACHED)
F - RECEIPT ACKNOWLEDGED
G - OTHER (Specify)

ACTION CODES TO BE INSERTED IN COLUMN G, SECTION I, ENG FORM 4025 (Attach sheets, when required.)

ITEM NO. (Taken from ENG Form 4025)								
CODE GIVEN								

REMARKS

OCT - 7 1994

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE

ENG FORM 1 NOV 74 4026 EDITION OF NOV 66 MAY BE USED.

C.L. SLOAN ENGINEERING — MANDEVILLE, LOUISIANA

BY CLS DATE 9-22-94 SUBJECT RAMP SHEET NO. 1 OF 2

CHKD. BY ____ DATE ____ CLIENT B&K JOB NO. ____

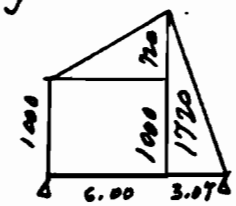
DEPTH	ELEV		C	
-0-	5.5			
4±	9.5	V. COMPACT TAN GRAY CLAYEY SILT	2000 psf	} AV. 1550 for top 6'
7±	12.5	D. TAN GRAY CLAYEY SAND	1000	
10±	15.5	S. GRAY SILTY CLAY	300	} AV. 900 for next 16'
13±	18.5	M. ST. DK. GRAY CLAY	1000	
17±	23.0	ST. BR. ORG. CLAY	1500	
20±	25.5	S. GRAY SILTY CLAY	400	

EQUIP. SURCHG. 1000 psf

$\gamma = 120$ (assumed)

$2C = 2 \times 900 \times 1800$

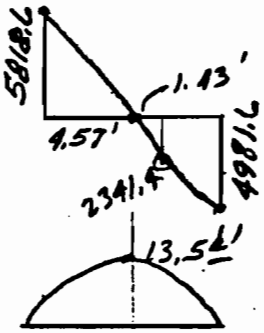
$\gamma H = 120 \times 16 = 1920$ } 3720

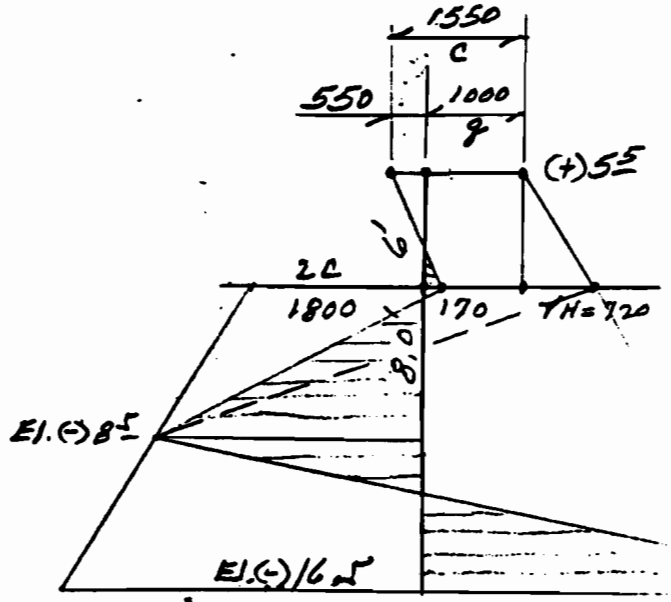


EQUIV. BEAM

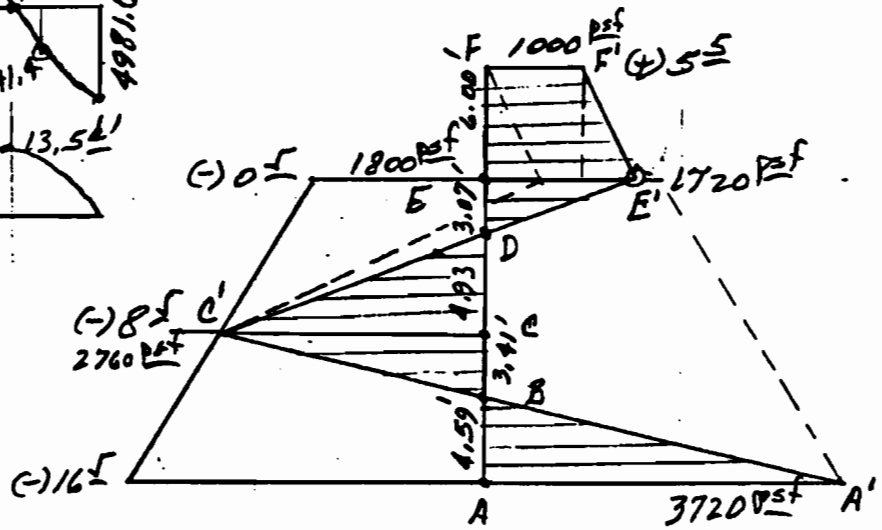
Use steel sheets
PZ-22 (lightest)
$Z = 18.1$ in³

$f = \frac{13.5 \times 12}{18.1} = 8.9$ ksi ok





— WITH COHESION —



— COHESION OMITTED —

WITHOUT COHESION REPRESENTS WORST CONDITION FOR SHEET PILE STRESSES.

STATE OF LOUISIANA
CHARLES L. SLOAN
REG. No. 5597
REGISTERED
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING

C. L. Sloan

Encl 1

C.L. SLOAN ENGINEERING — MANDEVILLE, LOUISIANA

BY CLS DATE 9-22-5 SUBJECT RAMP SHEET NO. 2 OF 2

CHKD. BY ____ DATE ____ CLIENT B & K JOB NO. ____

ELEV.	DESCRIPTION	COHESION	REF: BORING #11
(+) 5.5 TO (+) 1.5	V. Compact tan gray clayey silt	2000 psf	} use 3V.
(+) 1.5 TO (-) 1.5	Dense tan gray clayey sand	1000	
(-) 1.5 TO (-) 4.5	Soft Gray silty clay	300	
(-) 4.5 TO (-) 7.5	Med. stiff dark gray clay	1000	
(-) 7.5 TO (-) 12.0	stiff brown org. clay	1500	
(-) 12.0 TO (-) 14.5	soft gray silty clay	400	
(-) 14.5 TO (-) 20.5	V. loose gray silty clayey sand	200	

Assume $\gamma = 120$ pcf

$q = 1000$ psf

$\frac{480+720}{2} \times 2 = 1200$

$\frac{1}{2} \times 720 \times 1.42 = 511$

$\frac{1}{2} \times 2320 \times 4.05 = 4698$

6409 #/'

$\frac{1}{2} \times 2840 \times 10.53 = 14,953$

$F/S = \frac{14,953}{6409} = 2.3$ ok

$240 \times 2 \times \frac{1}{2} \times 15.32 = 3677$

$480 \times 2 \times 15.25 = 15024$

$720 \times 1.42 \times \frac{1}{2} \times 14.18 = 7249$

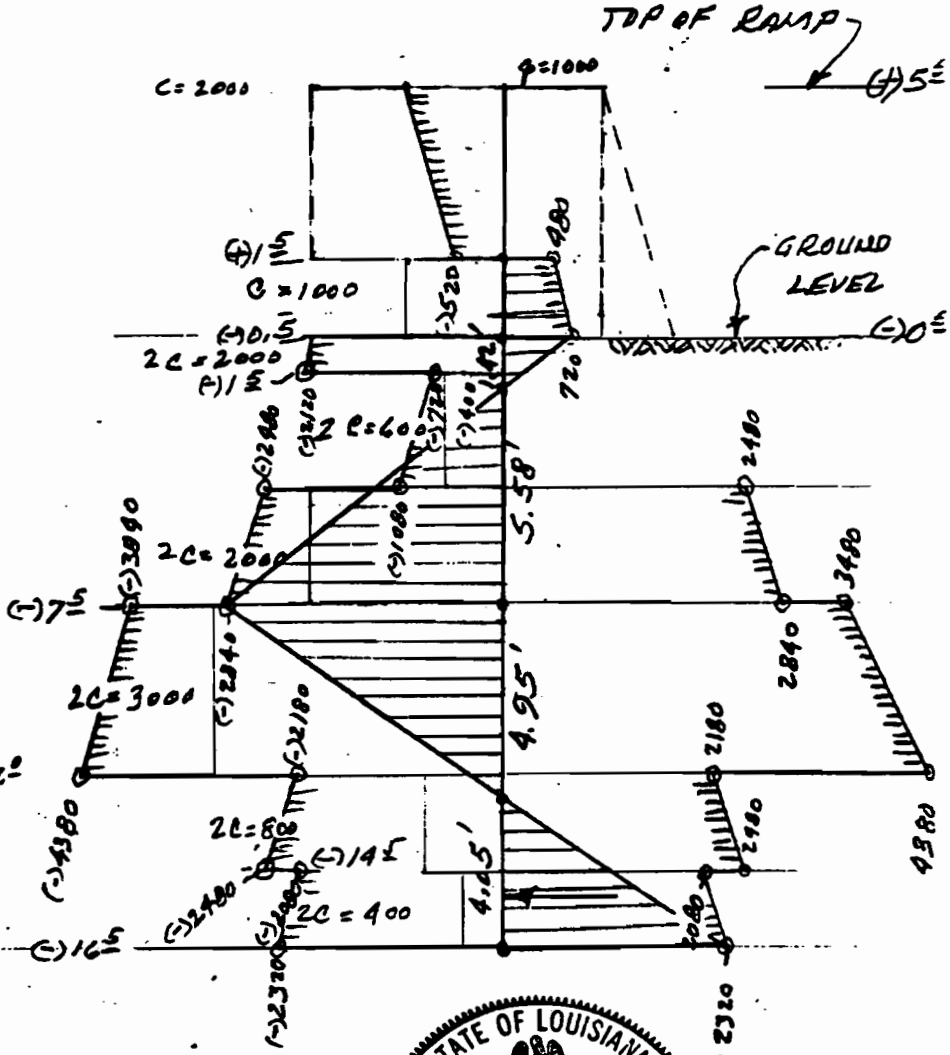
overturn $M_o = 25,950$ #/'

$2840 \times 5.58 \times \frac{1}{2} \times 9.51 = 75,353$

$2840 \times 4.95 \times \frac{1}{2} \times 6.00 = 42,174$

Restrain $M_o = 117,527$ #/'

$F/S = \frac{117,527}{25,950} = 4.5$ ok



STATE OF LOUISIANA
CHARLES L. SLOAN
REG. No. 5597
REGISTERED
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING

C. L. Sloan

TEMPORARY ACCESS ROAD

London Avenue Canal

We propose to add fill taken from the road base on our West Napoleon Project in Metairie to the existing levee to widen the crown from the existing wall out to 12' to allow access with our 20 ton crane and concrete trucks. We will scarify the existing levee surface prior to placment of the fill. The finished dirt surface will be sloped to drain toward the landside. We have calculated that we will be adding approximately 5000 CY of dirt over the 10,000 LF job. The outside slope of the road will not be steeper than 1 vertical on 1.5 horizontal. In certain areas, such as the south side of Robert E. Lee on the east baseline, because of the narrowness of the access we will drive steel sheets as per sketch attached. We have enclosed the Registered Engineers calculations on the sheet pile ramp. We have also enclosed 2 reports from the State Dept of Agriculture on the sandy loam material excavated from the W. Napoleon Job along with a sieve analysis and atterburg of the same material from Eustis Engineers, Inc. of New Orleans.

If conditions warrant, we will be adding geotextile fabric over this road after construction of the new I-wall and then topping it off with broken asphalt about 6" thick. This should allow all-weather access.

In the following stations we will be adding crushed asphalt over geotextile fabric instead of earth fill:

W/BL

Approx sta 70+00 to 77+00
101+00 to 103+00
108+00 to 110+00
112+00 to 115+80

E/BL

Approx sta 71+50 to 83+00
86+50 to 99+50

Upon completion of a section of levee I-wall, the asphalt and geotextile fabric will be removed, the levee shaped to its final grades and the material hauled off and disposed of in approved dumpsites.

EUSTIS ENGINEERING COMPANY, INC.
GEOTECHNICAL ENGINEERS
CONSTRUCTION QUALITY CONTROL AND MATERIALS TESTING
3011 28th Street • Metairie, Louisiana 70002 • 504-834-0157

2 May 1994

Post-it™ Fax Note 7671	Date 9/21/94	# of pages ▶ 3
To Jimmy	From Chris	
Co./Dept. B+OK	Co.	
Phone #	Phone #	
Fax #	Fax #	

Jefferson Parish
Department of Public Works
Suite 802
1221 Elmwood Park Boulevard
Harahan, Louisiana 70123

Attention Mr. Jose Gonzalez

Gentlemen:

Results of Soil Mechanics Laboratory Tests
Jefferson Parish
West Napoleon Avenue Improvements
Houma Boulevard to Harvard Avenue
Jefferson Parish, Louisiana
JPPW No. 90-009-RB
SP No. 742-07-42

On 25 April 1994, a representative of Eustis Engineering Company, Inc., obtained a sack sample of sand from the project site. The sand is intended for use as topsoil material.

Jefferson Parish
Department of Public Works

2 May 1994

One grain size analysis was performed on the sand as shown on the enclosure. This test indicated the material was in compliance with the project specifications.

Should you require any additional information, please do not hesitate to contact us.

Yours very truly,

EUSTIS ENGINEERING COMPANY, INC.

Lloyd A. Held, Jr.

LLOYD A. HELD, JR., P.E.

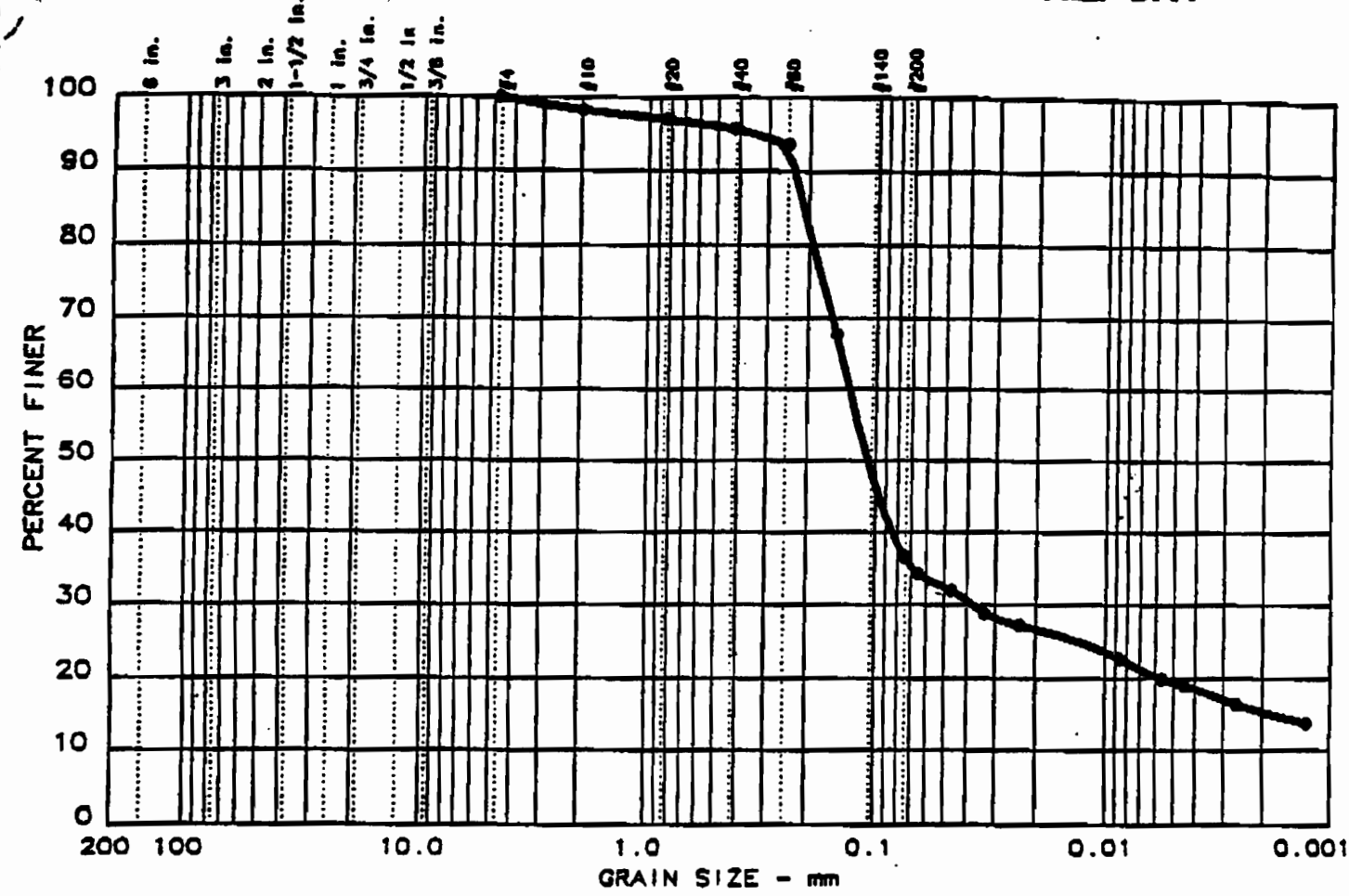
LAH:cr

EE 12210

Enclosure

xc J. J. Krebs and Sons, Inc., Mr. Bill Haensel; B & K Construction Company

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PI
●	0.0	0.0	63.4	17.1	19.5	A-7-6	41	24

SIEVE inches size	PERCENT FINER ●		
	GRAIN SIZE		
D_{60}	0.13		
D_{30}	0.04		
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ●
4	100.0
10	98.2
20	97.0
40	95.8
60	93.6
100	67.8
200	36.6

Sample Information:
● Sack
Dk G Clayey Sand
w/silt & shell frag

Remarks:
● Sampled 4-25-94
pH = 7.38

Eustis Engineering Company, Inc.

Project No.: 12210
Project: West Napoleon Avenue Improvements

Date: 4-27-94 Data Sheet No. ——

Louisiana State University
Agricultural Center

Division of Plant Science
Louisiana Cooperative Extension Service

Department of Agronomy
Louisiana Agricultural Experiment Station

126 Madison B. Sturgis Hall
Baton Rouge, LA 70803
(504) 388-1261

Soil Test Results

Date Sampled: / / Date Received: 08/24/94 Date Completed: 09/07/94

A. Elkins
3011 28th Street
Metairie LA 70002 Parish: Jefferson

Lab Number: 11477.1 Sample Identification: #2

Soil Area: Upland Texture: very fine sandy loam

SOIL TEST RESULTS AND INTERPRETATIONS:

	Results	Interpretation
pH	9.4	very high
Phosphorus, ppm	90	high
Sodium, ppm	22	very low
Potassium, ppm	37	very low
Magnesium, ppm	29	very low
Calcium, ppm	4373	high
Bases, meq/100g	22.3	
Organic Matter, %	0.41	

RECOMMENDATIONS:

		Nutrients Needed, lb/1000 sq. ft.		
Crop	Irrigate?	Nitrogen	Phosphate	Potash
Bermudagrass (sod and lawns)	yes			
maintain		See Sheet	0	2.3
establish		See Sheet	0.7	2.8

CONTACT YOUR COUNTY AGENT (TELEPHONE 504/838-1170) IF YOU HAVE ANY QUESTIONS ABOUT THIS REPORT. THE AGENT ALSO RECEIVES A COPY OF THIS REPORT AND MAY CONTACT YOU TO DISCUSS IT.
Enclosure: T 610

Agricultural Center
Division of Plant Science
Louisiana Cooperative Extension Service
Department of Agronomy
Louisiana Agricultural Experiment Station
128 Madison B. Sturgis Hall
Baton Rouge, LA 70803
(504) 388-1261

Soil Test Results

Date Sampled: / / Date Received: 08/24/94 Date Completed: 09/07/94

A. Elkins
3011 28th Street
Metairie LA 70002 Parish: Jefferson

Lab Number: 11476.1 Sample Identification: #1

Soil Area: Upland Texture: very fine sandy loam

SOIL TEST RESULTS AND INTERPRETATIONS:

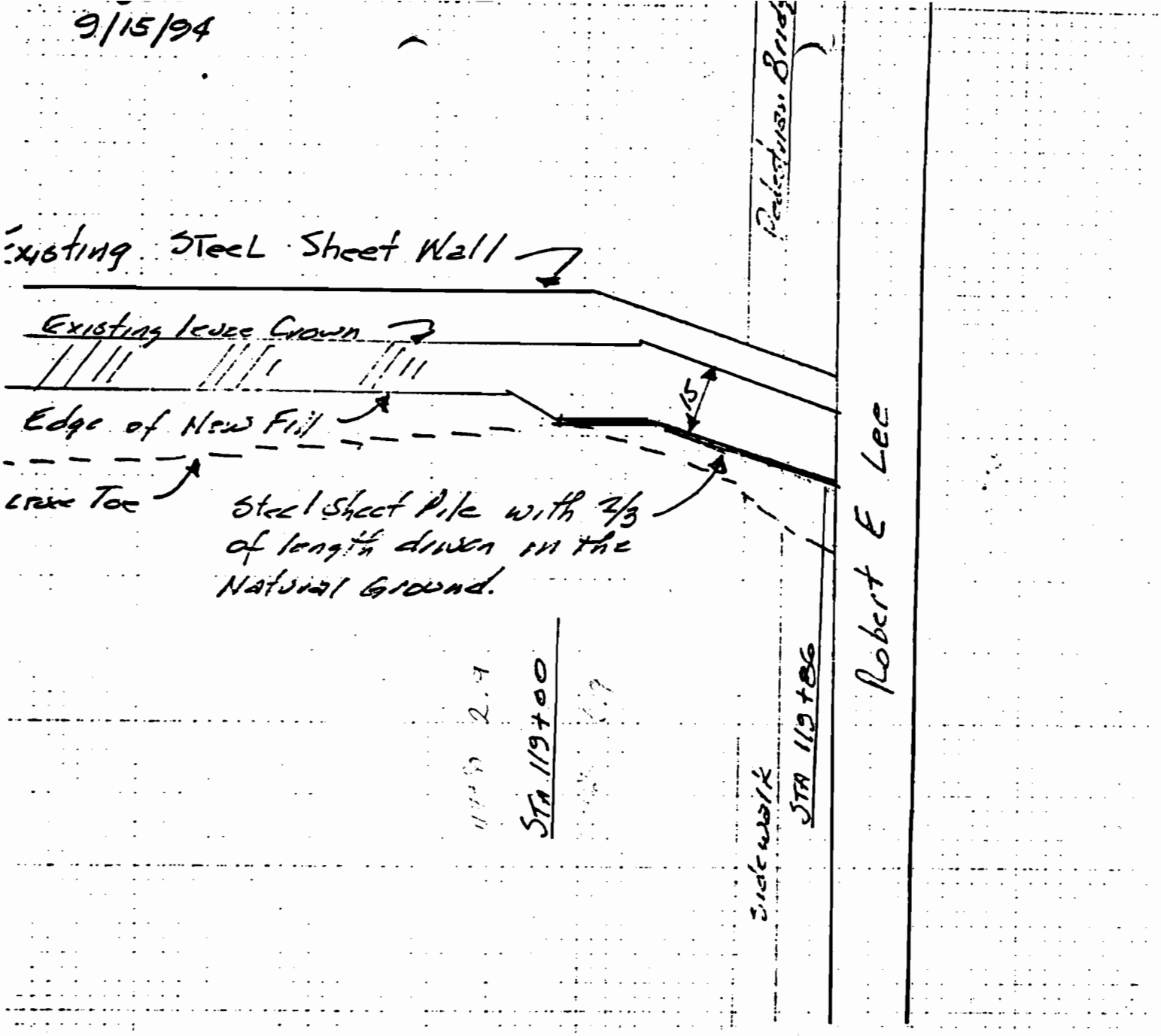
	Results	Interpretation
pH	8.9	very high
Phosphorus, ppm	97	very high
Sodium, ppm	26	very low
Potassium, ppm	49	very low
Magnesium, ppm	61	low
Calcium, ppm	4680	high
Bases, meq/100g	24.1	
Organic Matter, %	0.72	

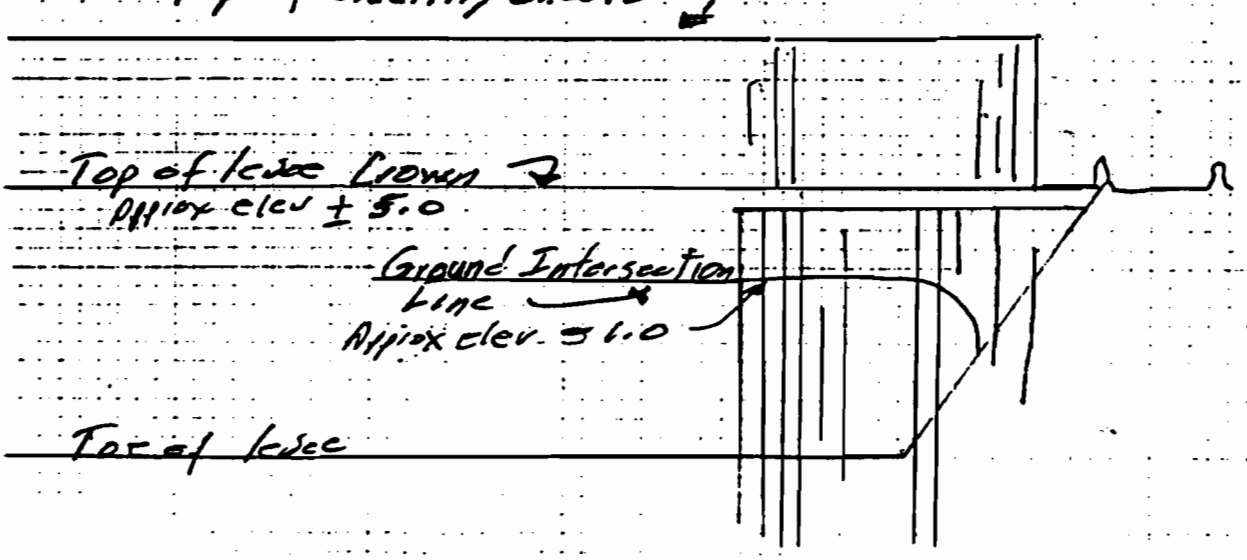
RECOMMENDATIONS:

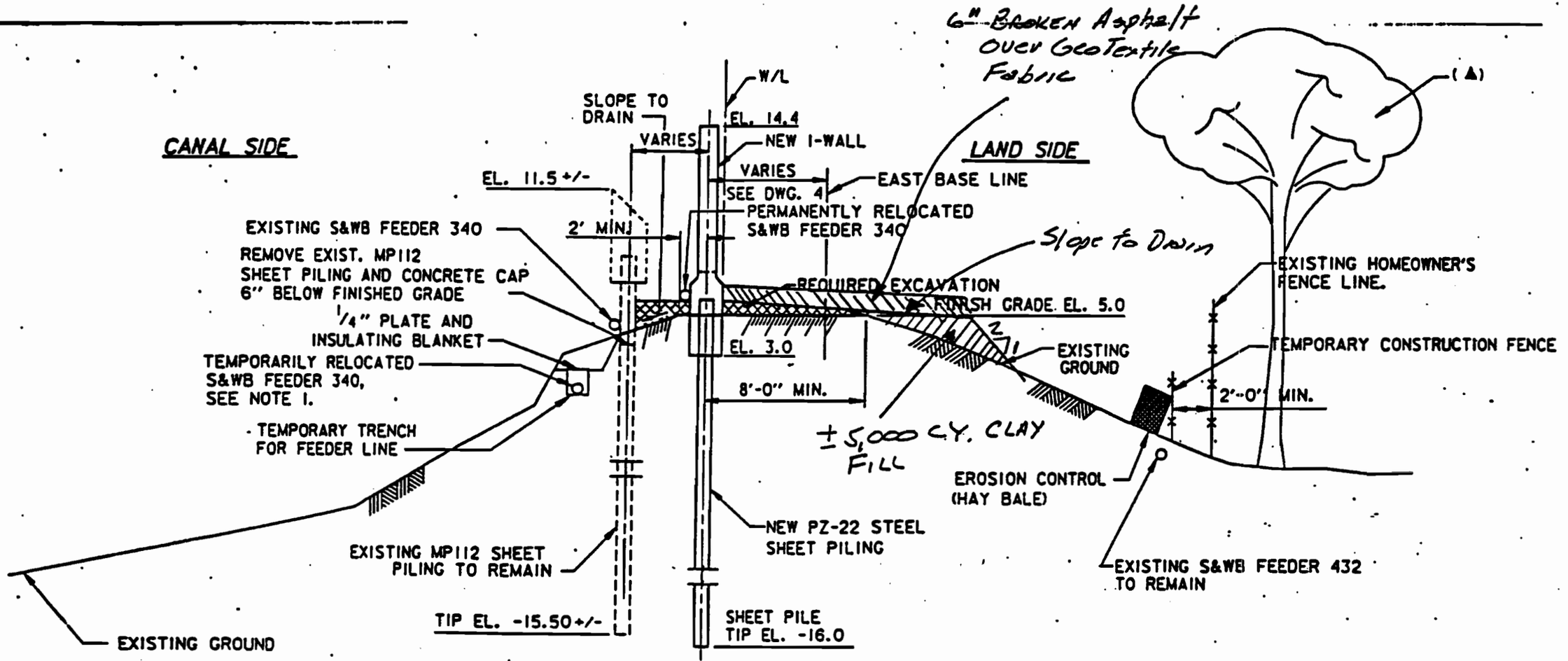
		Nutrients Needed, lb/1000 sq. ft.		
Crop	Irrigate?	Nitrogen	Phosphate	Potash
Bermudagrass (sod and lawns)	yes			
maintain		See Sheet	0	2.3
establish		See Sheet	0	2.8

CONTACT YOUR COUNTY AGENT (TELEPHONE 504/838-1170) IF YOU HAVE ANY QUESTIONS ABOUT THIS REPORT. THE AGENT ALSO RECEIVES A COPY OF THIS REPORT AND MAY CONTACT YOU TO DISCUSS IT.
Enclosure: T 610

9/15/94


Existing Steel Sheet Wall
Existing levee Crown
Edge of New Fill
levee Toe
Steel Sheet Pile with 2/3 of length driven in the Natural Ground.
15
STA 119+00
STA 119+86
Robert E Lee


Top of existing Sheets
Top of levee Crown
Approx elev ± 5.0
Ground Intersection Line
Approx elev ± 1.0
Toe of levee

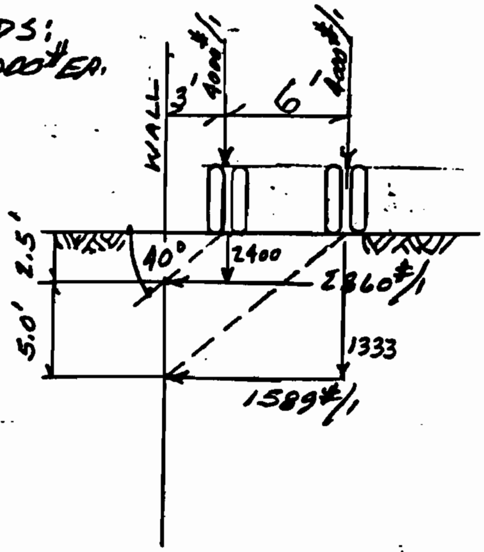


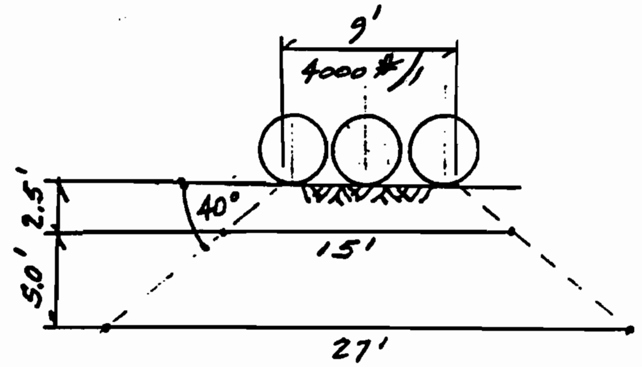
STA. 72+95.00 TO STA. 84+31.10 EB/L

SCALE: 1/4" = 1'-0"

BY C.L.S. DATE 10-5-94 SUBJECT LONDON AV. OUTFALL CA[illegible] SHEET NO. 1 OF 2
CHKD. BY ______ DATE ______ CLIENT BER JOB NO. ______

TRUCK LOADS:
3 AXLES @ 24,000# EA.

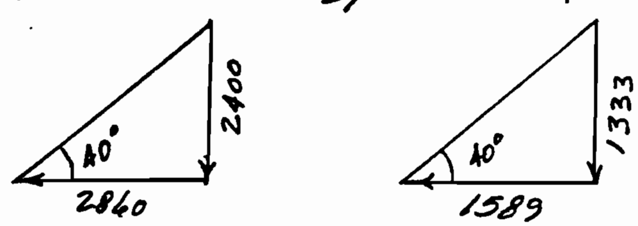




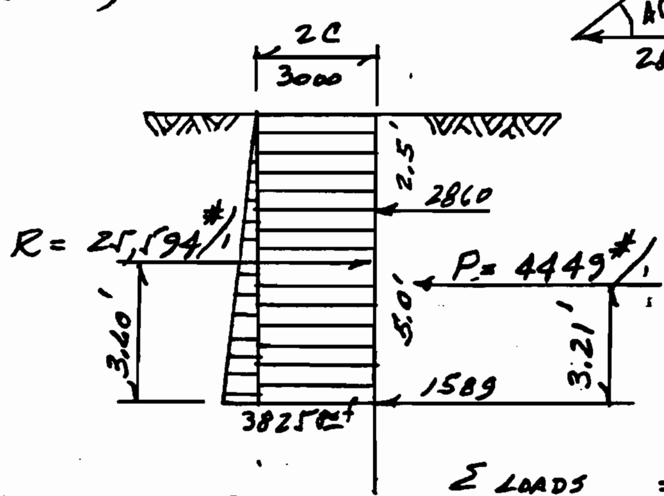
12^k/wheel: $\frac{3 \times 12}{9} = 4^k/LF$

Intensity 2.5' down $= \frac{9 \times 4000}{15} = 2400^{\#}/LF$

Intensity 7.5' down $= \frac{9 \times 4000}{27} = 1333^{\#}/LF$



C = 1500 psf (av.)
γ = 110 pcf (min.)



2860 × 5 = 14,300
1589 × -0- = -0-
4449 × 3.21' = 14,300

$\frac{1}{2} \times 825 \times 7.5 = 3094 \quad \times \frac{7.5}{3} = 7734$
$3000 \times 7.5 = 22\,500 \quad \times \frac{1}{2} \times 7.5 = 84\,375$
25,594 × 3.60 = 92,109

Σ LOADS = 4449#/1
Σ RESISTING FORCES = 25,594#/1 > 4449 ok
F/S = 5.75

- TRUCKS SHOULD PRESENT NO PROBLEMS TO THE SHEETPILE WALL -

- SINCE THE EARTH IS APPROXIMATELY THE SAME ELEVATION ON BOTH SIDES OF THE WALL, THERE IS NO DIFFERENTIAL LOAD FROM THE EARTH -

STATE OF LOUISIANA
CHARLES L. SLOAN
REG. No. 5597
REGISTERED
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING

BY CLS DATE 10-5-94 SUBJECT LONDON AV. OUTFALL CAN. SHEET NO. 2 OF 2

CHKD. BY ____ DATE ____ CLIENT BEK JOB NO. ____

LOADS: 2 AXLES @ 32,000 # EA. = 16 k/wheel

$\frac{2 \times 16}{4.5} = 7.111$ k/LF

Intensify 2.5' down = $\frac{4.5 \times 7111}{10.5} = 3048$ #/LF

Intensify 7.5' down = $\frac{4.5 \times 7111}{22.5} = 1422$ #/LF

HORIZ. LOADINGS: $\frac{3048}{\tan 40^\circ} = 3632$ #/'

$\frac{1422}{\tan 40^\circ} = 1695$ #/'

ENDRIE. LOADS: $3632 \times 5 = 18,160$

$1695 \times -0- = -0-$

$5327 \times 3.41' = 18,160$

Σ LOADS = 5327

Σ RESISTING FORCES (SH. 1) = 25,594 #/' > 5327 F/S = 4.8

B&K CONSTRUCTION COMPANY, INC.

FAX COVER MEMO

TO: NAME: Walter Baumy

COMPANY: USACOE

PHONE: (504) 862-2656 FAX: (504) 862-1585

FROM: NAME: D. Smith / Charlie Sloan

DATE: 10/25/94 (Sloan Engineering)

REFERENCE: USACOE DACW 29-94-C-0079
London Avenue Canal

Addt'l Info. Requested 10/24/95 via Phone with Charlie Sloan

NUMBER OF PAGES INCLUDING THIS SHEET: 5

ORIGINAL TO FOLLOW BY MAIL:

YES ✓ NO _____ UPON REQUEST _____

Submittal #9402-023E.1 Hand delivered to Chris Wagner this date.

D.S.

1905 HIGHWAY 59 • MANDEVILLE, LA 70448 • (504) 626-1666 • FAX (504) 626-9710

TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE

(Read instructions on the reverse side prior to initiating this form)

DATE: 10/25/94

TRANSMITTAL NO.: 9402-023E.1

SECTION I - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS *(This section will be initiated by the contractor)*

TO: Mr. Chester Ashley
U.S. ARMY CORPS OF ENGINEERS
P. O. Box 60267
NEW ORLEANS, LA 70160

FROM:
B & K CONSTRUCTION CO., INC.
1905 HWY. 59
MANDEVILLE, LA 70448

CONTRACT NO.: DACW29-94-C-0079

CHECK ONE:
[ ] THIS IS A NEW TRANSMITTAL
[X] THIS IS A RESUBMITTAL OF TRANSMITTAL

SPECIFICATION SEC. NO. (Cover only one section with each transmittal): C2B

PROJECT TITLE AND LOCATION: LONDON AVENUE CANAL - MIRABEAU TO LEON C. SIMON BLVD.

ITEM NO. a.	DESCRIPTION OF ITEM SUBMITTED (Type size, model number/etc.) b.	MFG OR CONTR. CAT., CURVE DRAWING OR BROCHURE NO. (See instruction no. 8) c.	NO. OF COPIES d.	CONTRACT REFERENCE DOCUMENT: SPEC. PARA. NO. e.	CONTRACT REFERENCE DOCUMENT: DRAWING SHEET NO. f.	FOR CONTRACTOR USE CODE g.	VARIATION (See instruction No. 6) h.	FOR CE USE CODE i.
002	Clearing & Grubbing Method		4	C2B-3				
	Dean Engineering (504)626-8302							
	Revised Calculations for Structural							
	Analysis of Sheetpile for access road							
	as Requested 10/24/94 by							
	Walter Bourg of Engineering							

REMARKS

(Fax) 862-1585 Engineering

FILE COPY

I certify that the above submitted items have been reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as otherwise stated.

B & K CONSTRUCTION CO., INC.

Deborah W. Smith

Deborah W. Smith, Project Coord.

SECTION II - APPROVAL ACTION

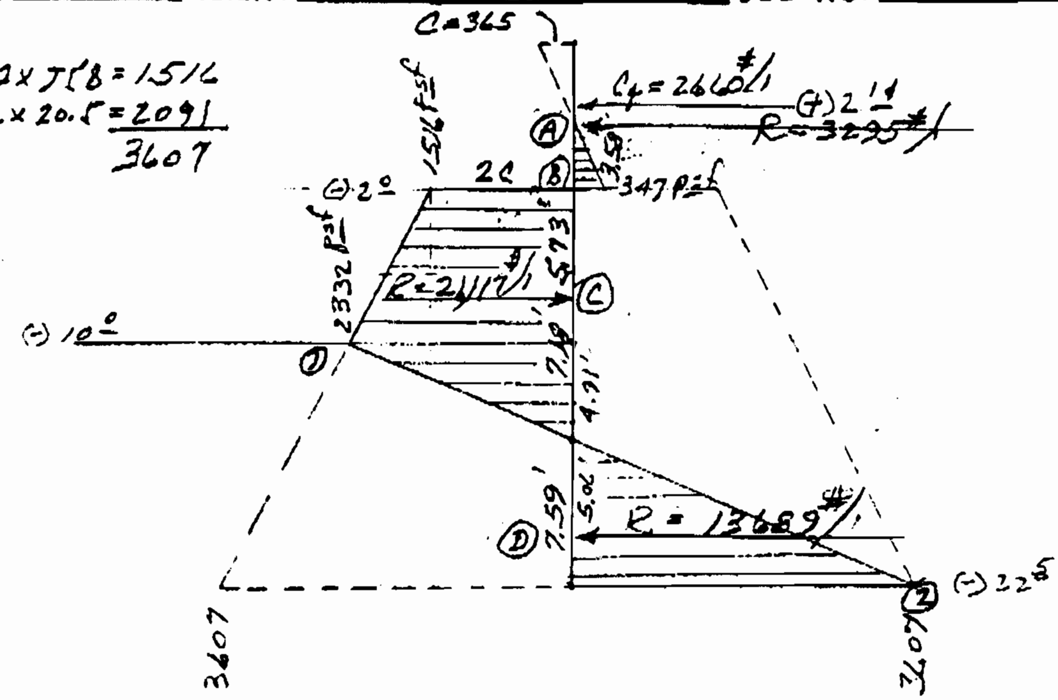
ENCLOSURES RETURNED (List by Item No.)	NAME, TITLE AND SIGNATURE OF APPROVING AUTHORITY	DATE

C.L. SLOAN ENGINEERING **MANDEVILLE, LOUISIANA**

BY ________ DATE 10-24-94 SUBJECT Ramp SHEET NO. 1 OF 3

CHKD. BY ________ DATE ________ CLIENT B&K JOB NO. ________

P_p: 2C = 2 × 758 = 1516
γH = 102 × 20.5 = 2091
3607



R_C: ½ × 4.91 × 2332 = 5725 × 9.64 = 55 189
½ × 8.01 × 816 = 3264 × 5.33 = 17 397
8.00 × 1516 = 12128 × 4.00 = 48 512
21 117 × 5.73' = 121 098

R_A: 2660 × 4.14 = 11 012
½ × 3.66 × 347 = 635 × 1.22 = 775
3295 × 3.58 = 11,787

R_D: ½ × 7.59 × 3607 = 13,689

ΣV: 3295 + 13689 = 16,984 ←
21,117 → F/S = 1.24

ΣM: 3295 × 21.55 = 71,007 ↶
21 117 × 12.24 = 258,472 ↷ F/S = 3.64

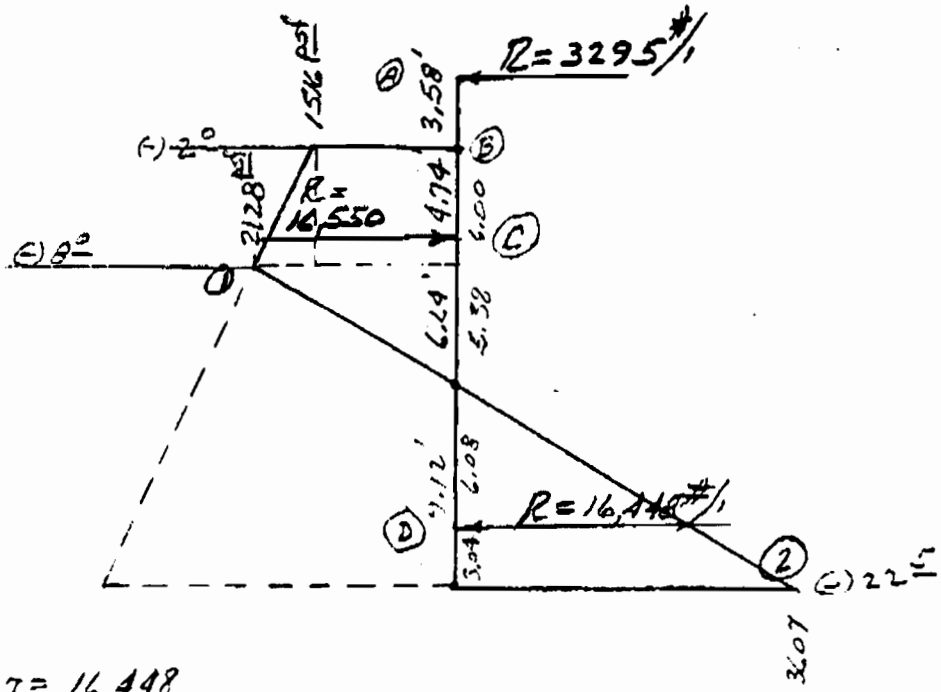
Bending Mo = (5.73 + 3.58) 3295 = 30,676 #'
Z = 18.1 in.³
f = 30 676 × 12 / 18.1 = 20,338 psi ok

STATE OF LOUISIANA
CHARLES L. SLOAN
REG. No. 5597
REGISTERED
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING

C.L. SLOAN ENGINEERING MANDEVILLE, LOUISIANA

BY _____ DATE 10/24/94 SUBJECT RAMP SHEET NO. 2 OF 3

CHKD. BY _____ DATE _____ CLIENT B&K JOB NO. _____



R_D: $\frac{1}{2} \times 9.12 \times 360° = 16,448$

R_C: $\frac{1}{2} \times 5.28 \times 2128 = 5618 \times 7.79 = 43764$
$\frac{1}{2} \times 6.00 \times 612 = 1836 \times 4.00 = 7344$
$6.00 \times 1516 = 9096 \times 3.00 = 27288$
$16550 \times 4.74' = 78,396$

Bending $M_o = 3295 \times 8.32 = 27,414$ #' (Gets less as line 1-2 slope gets steeper)

$Z = 18.1 \text{ in}^3$

$f = \frac{27414 \times 12}{18.1} = 18,175$ psi ok

C.L. SLOAN ENGINEERING MANDEVILLE, LOUISIANA

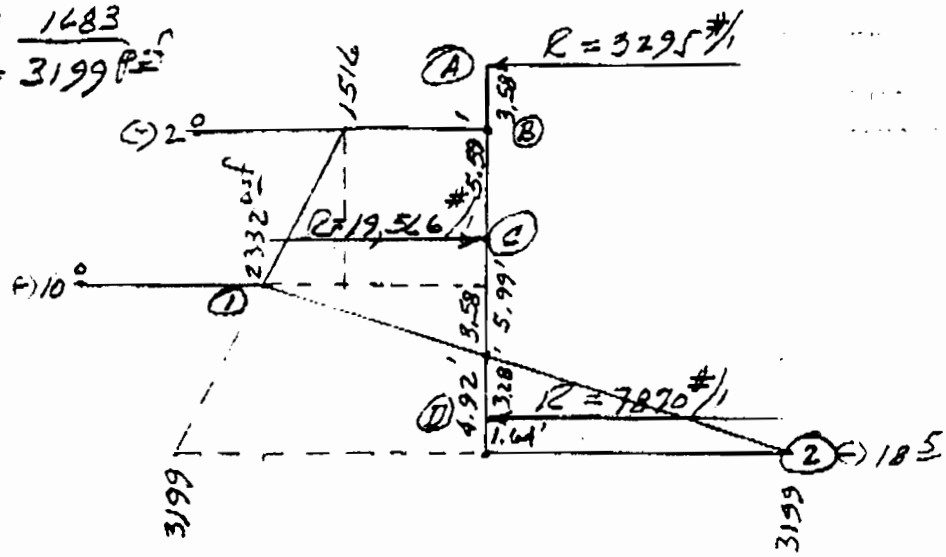
BY _____ DATE 10-21-94 SUBJECT RAMP SHEET NO. 3 OF 3

CHKD. BY _____ DATE _____ CLIENT B&K JOB NO. _____

2C = 1516

$\gamma H = 102 \times 16.5 = 1683$

@ (-) 18° = 3199 #/ft



$R_D = \frac{1}{2} \times 4.92 \times 3199 = 7870$

$\frac{1}{2} \times 3.58 \times 2332$	= 4174	× 10.39	= 43 368
$\frac{1}{2} \times 816 \times 8.0$	= 3264	× 5.33	= 17 397
8.0×1516	= 12128	× 4.00	= 48 512
	19566	× 5.59	= 109 277

ΣV: 7870 + 3295 = 11,165 ← F/S = 1.75

19,526 →

ΣM: 18.44 × 3295 = 60,760 ↶ F/S = 2.99

9.27 × 19566 = 181,377 ↷

Bending $M_o = (5.59 + 3.58)\,3295 = 30,215$ #'

$Z = 18.1\ in^3$

$f = \frac{30\,215 \times 12}{18.1} = 20,032$ psi ok

Use either 24' or 28' sheets

```
10 SLOAN ENGINEERING ACCESS RAMP
15 KSI FT IN IN LB
20 2 1 1 29000 0.3
30 1 0 0 2 28 0
40 FIX X 2 FIX Y 2 FIX R 2
50 1 1 2
60 84.4 1 1 1
70 LOAD CASE 1 0 5 1 0 0 NET PRESSURE
80 3.84 0 7.50 347 0 1
90 7.50 347 8.98 0 0 1
100 8.98 0 21.5 -2944 0 1
110 21.5 -2944 25.06 0 0 1
120 25.06 0 28.0 2438 0 1
130 1 3.84 2660 0 1
```

1*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
PROGRAM CFRAME V02.05 24JUL84
--*-*-*-*-*-*-*-*-*-*-*-*-*

RUN DATE = 94/10/21
RUN TIME = 9.13.36

SLOAN ENGINEERING ACCESS RAMP

*** JOINT DATA ***

JOINT	X	Y	FIXITY X	FIXITY Y	FIXITY R	KX	KY	KR
	--- FT ---					---LB / IN---		IN-LB /RAD
1	.00	.00						
2	28.00	.00	*	*	*			

*** MEMBER DATA ***

MEMBER	END A	END B	LENGTH FT	I IN**4	A IN**2	AS IN**2	E KSI	G KSI
1	1	2	28.00	.8440E+02	.1000E+01	.1000E+01	.2900E+05	.1115E+05

*** LOAD CASE 1 NET PRESSURE

MEMBER	LA FT	PA LB / FT	LB FT	PB LB / FT	ANGLE DEG
1	3.84	.0000E+00	7.50	.3470E+03	.00
1	7.50	.3470E+03	8.98	.0000E+00	.00
1	8.98	.0000E+00	21.50	-.2944E+04	.00
1	21.50	-.2944E+04	25.06	.0000E+00	.00
1	25.06	.0000E+00	28.00	.2438E+04	.00

MEMBER	L FT	P LB	ANGLE DEG
1	3.84	.2660E+04	.00

1 LOAD CASE 1 NET PRESSURE

JOINT DISPLACEMENTS

JOINT	DX IN	DY IN	DR RAD
1	.0000E+00	.6611E+01	-.1326E-01
2	.0000E+00	.0000E+00	.0000E+00

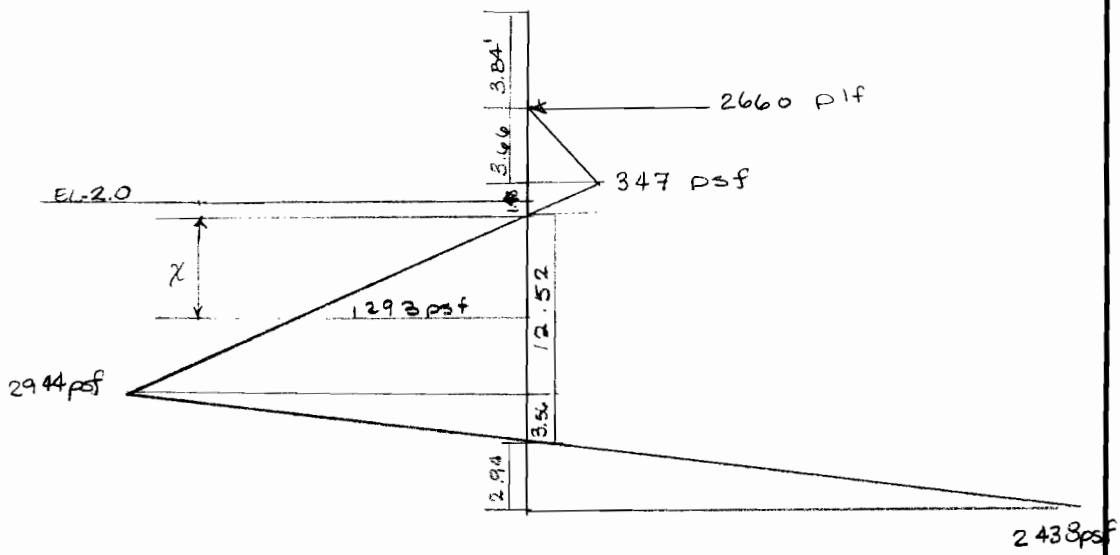
MEMBER END FORCES

MEMBER	JOINT	AXIAL LB	SHEAR LB	MOMENT IN-LB	MOMENT EXTREMA IN-LB	LOCATION IN
1	1	.0000E+00	.0000E+00	.0000E+00	.1654E+07	336.00
	2	.0000E+00	-.1653E+05	.1654E+07	-.3438E+06	174.72

STRUCTURE REACTIONS

JOINT	FORCE X LB	FORCE Y LB	MOMENT IN-LB
2	.0000E+00	-.1653E+05	.1654E+07
TOTAL	.0000E+00	-.1653E+05	

PROJECT	PAGE OF	COMPUTED BY	DATE
SUBJECT		CHECKED BY	DATE



Point of zero shear distance X

$$2660 \text{ plf} + \tfrac{1}{2}(347)(3.66) + \tfrac{1}{2}(347)(1.48) - \tfrac{1}{2} X \left(\frac{2944}{12.52}\right) X$$

$$2660 + 635 + 256.78 - 117.6 X^2$$

$$X = 5.50'$$

M_{MAX}

$$\tfrac{1}{2}(347)(3.66)\left(\tfrac{1}{3}(3.66) + 1.48 + 5.5\right) + \tfrac{1}{2}(347)(1.48)\left(\tfrac{2}{3}(1.48) + 5.5\right) + 2660(3.66 + 1.48 + 5.5) - \tfrac{1}{2}(1293)(5.5)\left(\tfrac{1}{3}\right)(5.5)$$

$$5207 + 10666 + 28302 - 6519$$

$$28656 \text{ ft-lb}$$

$$f_b = \frac{28656\,(12)}{18.1} = 19 \text{ ksi}$$

MAIL LISTING FOR Angela Desoto October 19, 1994

- - Mail - -

October 19, 1994 9:50am MAIL IS - Delvry&View

FROM: Frank Vojkovich
TO: Angela Desoto
SUBJECT: LONDON AVE CANAL CONT. 3 RAMP
ENCLOSURES:
CSUBE DATA FILE

ENCLOSED IS THE CWALSHT FILE FOR THE RAMP. FOR THE TIP ELEVATION OF -22.5 I USED F.S. EQUAL 1.34 AND USED A LOWER P.S. SIDE ELEVATION (MINIMUM GROUND SURFACE ELEVATIONS FOR THAT REACH). IF I USED EL. 0. AS SLOAN USED I WOULD HAVE A LARGER F.S.

```
100 'LONDON AVE CANAL'
110 'RAMP AT ROBT. E. LEE FILE CSUBE'
130 CONTROL C D 1.34 1.34
140 WALL 5.5
145 SURFACE RIGHTSIDE 1
180 0 5.5
190 SURFACE LEFTSIDE 2
200 0 0 15 -6.8
210 SOIL RIGHTSIDE STRENGTH 5
215 120 120 30 0 0 0 4 0 0 0
220 109 109 0 700 0 0 0 0 0 0
230 96 96 0 400 0 0 -6 0 0 0
240 102 102 0 320 0 0 -12 0 0 0
260 122 122 30 0 0 0
210 SOIL LEFTSIDE STRENGTH 3
272 96 96 0 400 0 0 -6 0 0 0
274 102 102 0 320 0 0 -12 0 0 0
278 122 122 30 0 0 0
260 WATER ELEVATIONS 62.5 0 0
265 VERTICAL LINE RIGHTSIDE 2 4 1600 10 1600
270 FINISH
```

$\frac{16000(2)}{20} = 1600$ plf

-3.06

FS = 0 -5

FS = 0 -6.8 From b

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS

DATE: 94/10/19 TIME: 11.35.54

****
* INPUT DATA *
****

I.--HEADING:
'LONDON AVE CANAL'
'RAMP AT ROBT. E. LEE FILE CSUBE'

II.--CONTROL
CANTILEVER WALL DESIGN

LEVEL 1 FACTOR OF SAFETY FOR ACTIVE PRESSURES = 1.34
LEVEL 1 FACTOR OF SAFETY FOR PASSIVE PRESSURES = 1.34

III.--WALL DATA
ELEVATION AT TOP OF WALL = 5.50 (FT)

IV.--SURFACE POINT DATA

IV.A--RIGHTSIDE

DIST. FROM WALL (FT)	ELEVATION (FT)
.00	5.50

IV.B-- LEFTSIDE

DIST. FROM WALL (FT)	ELEVATION (FT)
.00	.00
15.00	-6.80

V.--SOIL LAYER DATA

V.A.--RIGHTSIDE LAYER DATA
LEVEL 2 FACTOR OF SAFETY FOR ACTIVE PRESSURES = DEFAULT
LEVEL 2 FACTOR OF SAFETY FOR PASSIVE PRESSURES = DEFAULT

SAT. WGHT. (PCF)	MOIST WGHT. (PCF)	ANGLE OF INTERNAL FRICTION (DEG)	COH-ESION (PSF)	ANGLE OF WALL FRICTION (DEG)	ADH-ESION (PSF)	<--BOTTOM--> ELEV. (FT)	SLOPE (FT/FT)	<-SAFETY-> <-FACTOR-> ACT.	PASS.
120.00	120.00	30.00	.0	.00	.0	4.00	.00	DEF	DEF
109.00	109.00	.00	700.0	.00	.0	.00	.00	DEF	DEF
96.00	96.00	.00	400.0	.00	.0	-6.00	.00	DEF	DEF
102.00	102.00	.00	320.0	.00	.0	-12.00	.00	DEF	DEF
122.00	122.00	30.00	.0	.00	.0			DEF	DEF

V.B.-- LEFTSIDE LAYER DATA
LEVEL 2 FACTOR OF SAFETY FOR ACTIVE PRESSURES = DEFAULT
LEVEL 2 FACTOR OF SAFETY FOR PASSIVE PRESSURES = DEFAULT

SAT. WGHT. (PCF)	MOIST WGHT. (PCF)	ANGLE OF INTERNAL FRICTION (DEG)	COH-ESION (PSF)	ANGLE OF WALL FRICTION (DEG)	ADH-ESION (PSF)	<--BOTTOM--> ELEV. (FT)	SLOPE (FT/FT)	<-SAFETY-> <-FACTOR-> ACT.	PASS.
96.00	96.00	.00	400.0	.00	.0	-6.00	.00	DEF	DEF
102.00	102.00	.00	320.0	.00	.0	-12.00	.00	DEF	DEF
122.00	122.00	30.00	.0	.00	.0			DEF	DEF

VI.--WATER DATA

UNIT WEIGHT = 62.50 (PCF)
RIGHTSIDE ELEVATION = .00 (FT)
LEFTSIDE ELEVATION = .00 (FT)
NO SEEPAGE

VII.--SURFACE LOADS

VII.A.--RIGHTSIDE SURFACE LOADS

VII.A.1.--SURFACE LINE LOADS

DIST. FROM WALL (FT)	LINE LOAD (PLF)
4.00	1600.00
10.00	1600.00

VII.A.2.--SURFACE DISTRIBUTED LOADS
NONE

VII.B.-- LEFTSIDE SURFACE LOADS
NONE

VIII.--HORIZONTAL LOADS
NONE

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
BY CLASSICAL METHODS
DATE: 94/10/19 TIME: 11.36.39

****
* SUMMARY OF RESULTS FOR *
* CANTILEVER WALL DESIGN *

****

I.--HEADING

'LONDON AVE CANAL'
'RAMP AT ROBT. E. LEE FILE CSUBE'

II.--SUMMARY

RIGHTSIDE SOIL PRESSURES DETERMINED BY COULOMB COEFFICIENTS AND THEORY OF ELASTICITY EQUATIONS FOR SURCHARGE LOADS.

LEFTSIDE SOIL PRESSURES DETERMINED BY FIXED SURFACE WEDGE METHOD.

WALL BOTTOM ELEV. (FT)	:	-22.41
PENETRATION (FT)	:	22.41
MAX. BEND. MOMENT (LB-FT)	:	9123.
AT ELEVATION (FT)	:	-15.50
MAX. SCALED DEFL. (LB-IN3)	:	3.9868E+09
AT ELEVATION (FT)	:	5.50

(NOTE: DIVIDE SCALED DEFLECTION BY MODULUS OF ELASTICITY IN PSI TIMES PILE MOMENT OF INERTIA IN IN**4 TO OBTAIN DEFLECTION IN INCHES.)

PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS BY CLASSICAL METHODS

DATE: 94/10/19 TIME: 11.36.39

****
* COMPLETE RESULTS FOR *
* CANTILEVER WALL DESIGN *
****

I.--HEADING

'LONDON AVE CANAL'
'RAMP AT ROBT. E. LEE FILE CSUBE'

III.--RESULTS

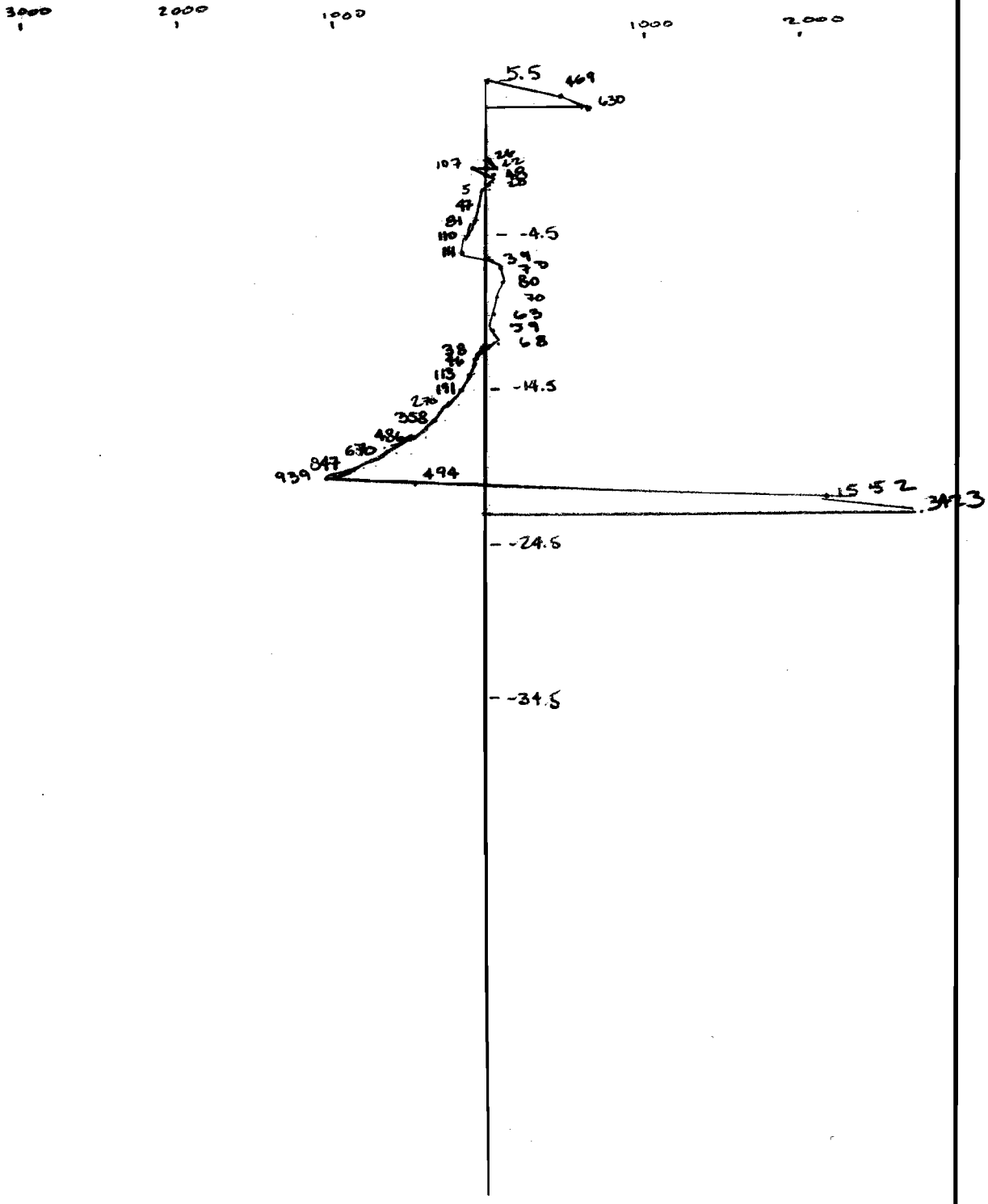
ELEVATION (FT)	BENDING MOMENT (LB-FT)	SHEAR (LB)	SCALED DEFLECTION (LB-IN3)	NET PRESSURE (PSF)
5.50	0.	0.	3.9868E+09	.00
4.50	78.	235.	3.7523E+09	469.02

4.00	261.	509.	3.6350E+09	630.93
4.00	261.	509.	3.6350E+09	.00
3.50	516.	509.	3.5179E+09	.00
2.50	1025.	509.	3.2844E+09	.00
1.50	1535.	509.	3.0527E+09	.00
1.43	1571.	509.	3.0361E+09	.00
.50	2048.	522.	2.8236E+09	26.10
.00	2313.	539.	2.7104E+09	42.00
.00	2313.	539.	2.7104E+09	-107.25
-.50	2575.	524.	2.5981E+09	48.25
-1.00	2842.	541.	2.4869E+09	20.39
-1.50	3114.	545.	2.3770E+09	-4.68
-2.50	3649.	519.	2.1613E+09	-47.32
-3.50	4139.	455.	1.9519E+09	-81.46
-4.50	4548.	359.	1.7497E+09	-110.17
-5.50	4851.	248.	1.5553E+09	-111.29
-6.00	4968.	230.	1.4612E+09	39.24
-6.50	5089.	258.	1.3693E+09	73.00
-7.50	5385.	335.	1.1920E+09	80.75
-8.50	5759.	410.	1.0241E+09	69.98
-9.50	6203.	477.	8.6615E+08	63.61
-10.50	6711.	538.	7.1893E+08	58.94
-10.89	6923.	562.	6.6514E+08	62.45
-11.50	7280.	602.	5.8331E+08	68.02
-12.00	7585.	609.	5.2015E+08	-38.19
-12.50	7885.	588.	4.6028E+08	-46.93
-13.50	8438.	508.	3.5086E+08	-113.76
-14.50	8876.	355.	2.5601E+08	-191.44
-15.50	9123.	125.	1.7647E+08	-269.65
-16.50	9098.	-190.	1.1266E+08	-358.51
-17.50	8708.	-612.	6.4513E+07	-486.19
-18.50	7822.	-1190.	3.1343E+07	-669.77
-19.50	6268.	-1948.	1.1593E+07	-847.39
-20.28	4474.	-2648.	3.7911E+06	-939.33
-20.50	3880.	-2803.	2.5521E+06	-494.61
-21.50	1170.	-2275.	1.5336E+05	1552.38
-22.41	0.	0.	0.0000E+00	3423.74

(NOTE: DIVIDE SCALED DEFLECTION BY MODULUS OF ELASTICITY IN PSI TIMES PILE MOMENT OF INERTIA IN IN**4 TO OBTAIN DEFLECTION IN INCHES.)

COMPUTATION SHEET

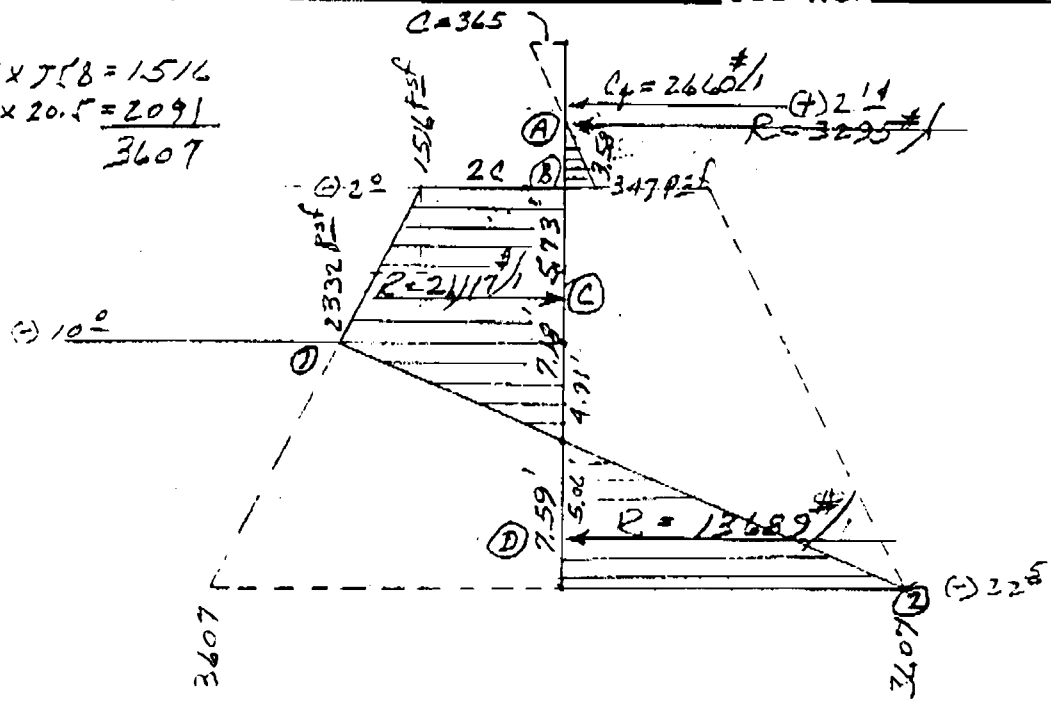
PROJECT	PAGE OF	COMPUTED BY	DATE
SUBJECT		CHECKED BY	DATE



SLOAN ENGINEERING — MANDEVILLE, LOUISIANA

BY _____ DATE 10-24-94 SUBJECT RAMP SHEET NO. 1 OF 3

CHKD. BY _____ DATE _____ CLIENT B & K JOB NO. _____



P_P: $2C = 2 \times 758 = 1516$

$\gamma H = 102 \times 20.5 = 2091$

3607

R_B: $\frac{1}{2} \times 4.91 \times 2332 = 5725 \times 9.64 = 55\,189$

$\frac{1}{2} \times 8.00 \times 816 = 3264 \times 5.33 = 17\,397$

$8.00 \times 1516 = 12128 \times 1.00 = 48\,512$

$21\,117 \times 5.73' = 121\,098$

R_A: $\frac{1}{2} \times 3.66 \times 347 = 2660 \times 4.14 = 11\,012$

$635 \times 1.22 = 775$

$3295 \times 3.58 = 11,787$

R_D: $\frac{1}{2} \times 7.59 \times 3607 = 13,689$

ΣV: $3295 + 13689 = 16,984 \leftarrow$

$21,117 \rightarrow$ $F/S = 1.24$

ΣM: $3295 \times 21.55 = 71,007 \leftarrow$

$21117 \times 12.24 = 258,472 \rightarrow$ $F/S = 3.64$

Bending $M_o = (5.73 + 3.58)\,3295 = 30,676^{\#'}$

$Z = 18.1$ in.^{3}

$f = \frac{30\,676 \times 12}{18.1} = 20,338$ psi ok

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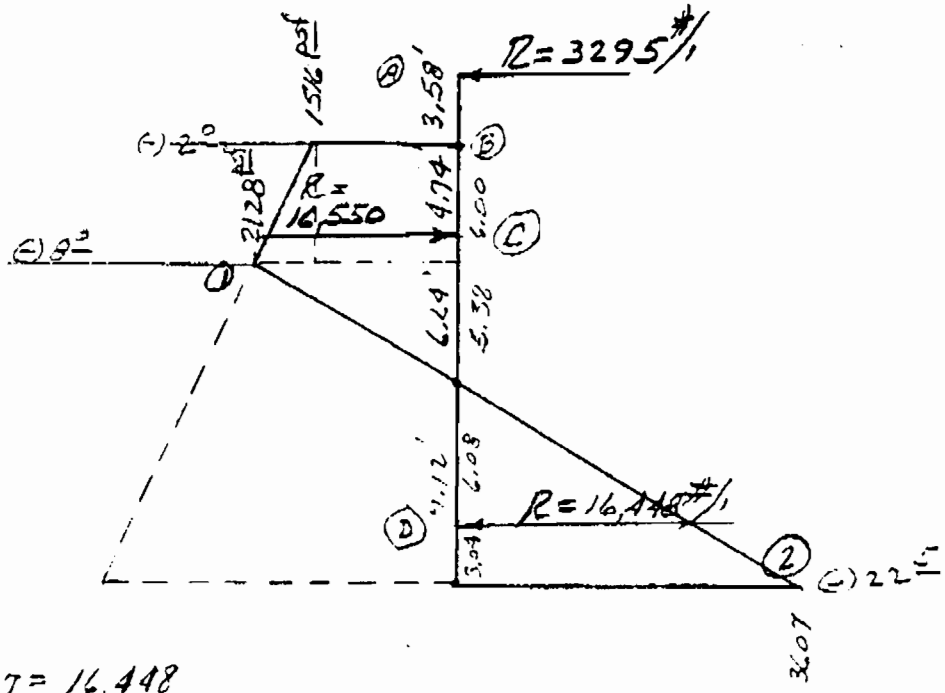


R_D: $\frac{1}{2} \times 9.12 \times 360^\circ = 16,448$

R_C: $\frac{1}{2} \times 5.28 \times 2128 = 5618 \times 7.79 = 43764$

$\frac{1}{2} \times 6.00 \times 612 = 1836 \times 4.00 = 7344$

$6.00 \times 1516 = 9096 \times 3.00 = 27288$

$16550 \times 4.74' = 78,396$

Bending $M_0 = 3295 \times 8.32 = 27,414^{\#'}$ (Gets less as line 1-2 slope gets steeper)

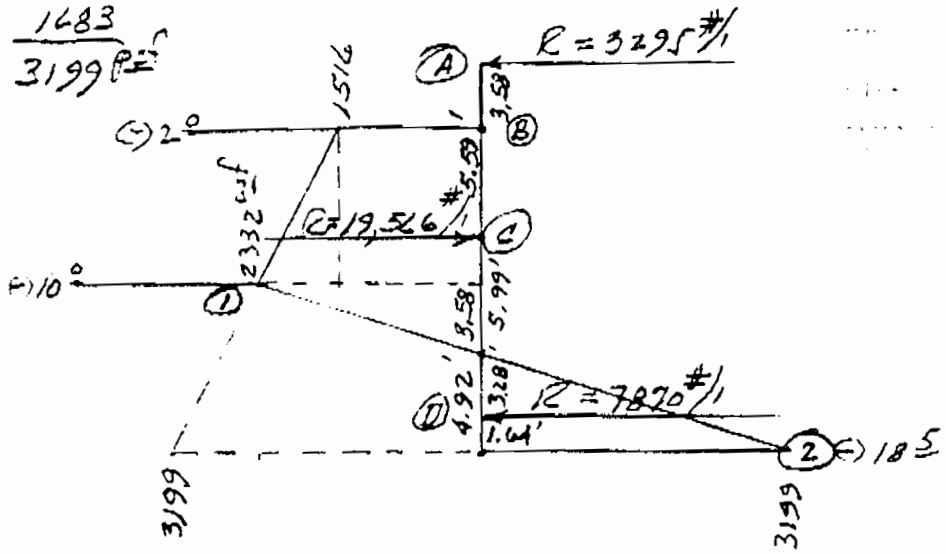
$Z = 18.1 \text{ in}^3$

$f = \frac{27414 \times 12}{18.1} = 18,175 \text{ psi}$ ok

$2c = 1516$

$\gamma H = 102 \times 16 = 1683$

$@ \leftarrow 18° = 3199$ psf



$R_D = \frac{1}{2} \times 4.92 \times 3199 = 7870$

$\frac{1}{2} \times 3.58 \times 2332$	= 4174	× 10.39	= 43 368
$\frac{1}{2} \times 816 \times 8.0$	= 3264	× 5.33	= 17 397
8.0×1516	= 12128	× 4.00	= 48 512
	19566	× 5.59	= 109 277

ΣV: $7870 + 3295 = 11,165 \leftarrow$ $F/S = 1.75$

$19526 \rightarrow$

ΣM: $18.44 \times 3295 = 60,760$ ↶ $F/S = 2.99$

$9.27 \times 19566 = 181,377$ ↷

Bending $M_o = (5.59 + 3.58)\,3295 = 30,215$ #/'

$Z = 18.1$ in^3

$f = \frac{30\,215 \times 12}{18.1} = 20,032$ psi ok

Use either 24' or 28' sheets

B&K CONSTRUCTION COMPANY, INC.

FAX COVER MEMO

TO: NAME: Angelia Deleto

COMPANY: USACOE

PHONE: _____ FAX: 862-1585

FROM: NAME: Deborah Smith

DATE: 10-21-94

REFERENCE: Sloan Engineering Calculations and Structural Analysis of Sheetpile - Addt'l information for Submittal # 9402-023 (C2B-3 #002)

NUMBER OF PAGES INCLUDING THIS SHEET: 4

ORIGINAL TO FOLLOW BY MAIL:

YES ✓ NO _____ UPON REQUEST _____

Originals will be processed to Mr. Chester Ashley as Submittal #9402-023E (Addt'l info as requested by Engineering) Temp. Access Road.

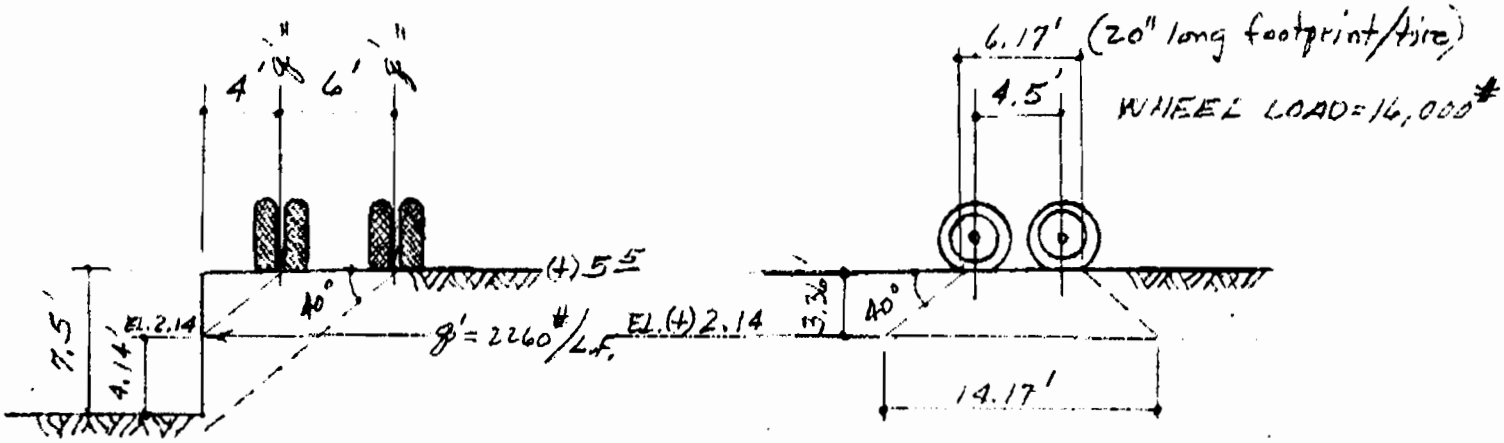
1905 HIGHWAY 59 • MANDEVILLE, LA 70448 • (504) 626-1866 • FAX (504) 626-9710

C.L. SLOAN ENGINEERING — MANDEVILLE, LOUISIANA

BY _____ DATE 10-11-94 SUBJECT RAMP SHEET NO. 1 OF 2

CHKD. BY _____ DATE _____ CLIENT BEK JOB NO. _____

REF. BORING 62 (BORINGS 25 & 26 INDICATE BETTER SOIL)



INTENSITY @ EL. (+) 2.14 = $\frac{32000}{14.1667}$ = 2259 #/L.F.

USE 2260

DEPTH OF SAMPLE	γ	q_u	C	
				(+)5±
2.0'	105.5	1475	737.5	
				(+)3.1
5.0'	76.5	625	312.5	
				(+)0.1
8.0'	106.6	390	195.0	
				(-)2.3
44.0'	102.1	1515	757.5	

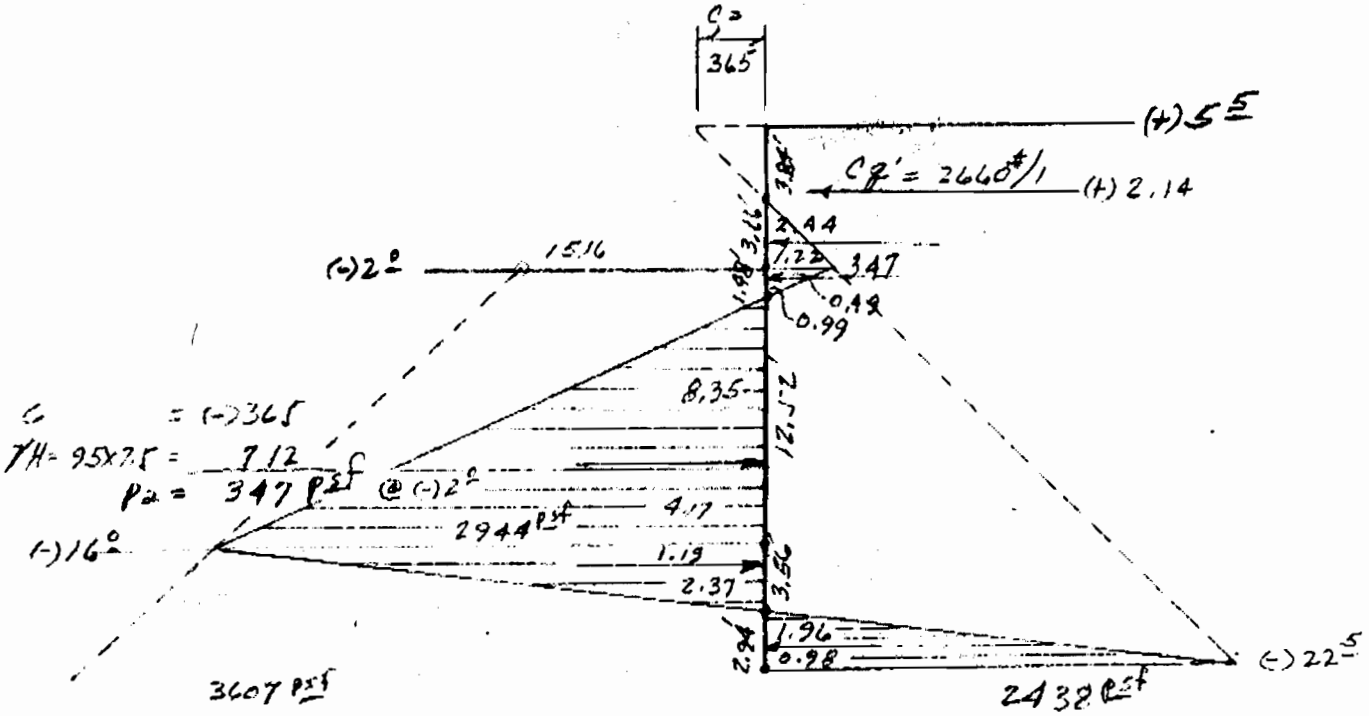
AV. γ = 95 pcf
AV. C = 365 psf
} 5± to (-)2.3

Below (-)2.3: γ = 102 pcf
C = 758 psf

C.L. SLOAN ENGINEERING — MANDEVILLE, LOUISIANA

BY _____ DATE 10-11-94 SUBJECT RAMP SHEET NO. 2 OF 2

CHKD. BY _____ DATE _____ CLIENT BEK JOB NO. _____



ΣC = 2 x 7.58 = (-) 15.16

VH = 20.5 x 1.02 = (-) 20.91

Pp = (-) 3607 psf @ (-) 22.5°

ΣV ACTING: Cq' = 2660

½ x 5.14 x 347 = 892

½ x 2.94 x 2438 = 3584

7136

ΣV RESISTING: ½ x 16.08 x 2944 = 23,670

> 7136

F/S = 3.3 ok

ΣM ACTING; 2660 x 24.64 = 65542

½ x 3.66 x 347 x 20.94 = 13170

½ x 1.48 x 347 x 19.03 = 4887

83,599 #'/LF

ΣM RESISTING:

½ x 12.52 x 2944 x 9.69 = 178581

½ x 3.56 x 2944 x 4.33 = 22691

201,272 #'/LF

F/S = 2.4 ok

INCLUDE Cq' FROM OUTSIDE WHEELS:

INTENSITY @ EL. (-) 2.89 = 32000 / 26.17 = 1223 #/LF

M = 21.61 x 1223 = 26,429

83,599

110,028 #'/LF

F/S = 201272 / 110,028 = 1.8

STATE OF LOUISIANA
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C.L. SLOAN ENGINEERING — MANDEVILLE, LOUISIANA

BY _____ DATE 10-21-94 SUBJECT RAMP SHEET NO. 1 OF 1

CHKD. BY _____ DATE _____ CLIENT BEK JOB NO. _____

USE THIS SHEET IN CONJUNCTION WITH SHEETS 1 & 2 of 2 DATED 10-11-94.

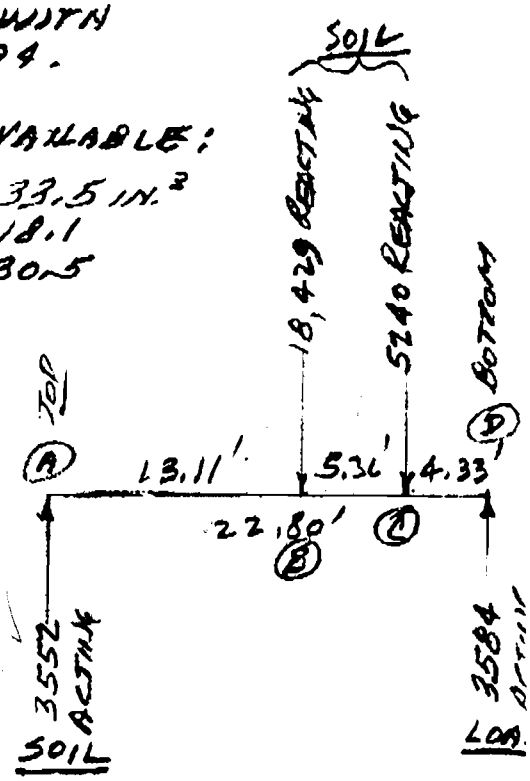
THE FOLLOWING PILE SECTIONS ARE AVAILABLE:

AZ 18 SECT. MOD. PER FT. OF WALL = 33.5 IN.^{3}
PZ 22 ..... = 18.1
RZ-10 ..... = 30.5

RESOLVE LOADING DIAG. (SH. 2) TO CONCENTRATED LOADS:

$\frac{1}{2} \times 2438 \times 2.94 = 3584\#/1$ @ -0-
$\frac{1}{2} \times 3.56 \times 2944 = 5240$ @ 4.33'
$\frac{1}{2} \times 12.52 \times 2944 = 18,429$ @ 9.69'

$\frac{1}{2} \times 1.48 \times 347 = 257$ @ 19.03'
$\frac{1}{2} \times 3.66 \times 347 = 635$ @ 20.74'
2660 @ 23.66



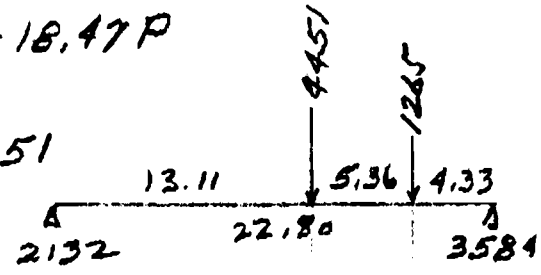
SINCE THE SOIL WILL REACT ONLY TO THE EXTENT IT MUST THE SOIL REACTION VALUES WILL BE REDUCED FROM THOSE SHOWN -

$\Sigma V = 0$; (B) & (C) WILL HAVE THE SAME RELATIVE VALUES:
(C) = P $B = \frac{18429}{5240} P = 3.52P$

$R_A = 3584 - 4.52P$

$\Sigma M = 0$; $22.80 \times 3584 = 13.11 \times 3.52P + 18.47P$
$64.62P = 81,716$
$P = 1265$ $3.52P = 4451$

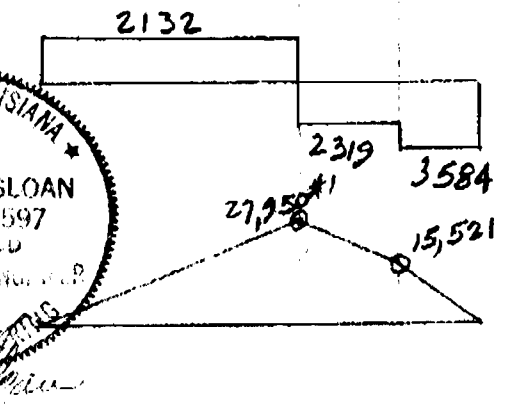
$R_A = 3584 - 4.52 \times 1265 = 2132$



$M_{max.} = 27,950\#'$

Use PZ 22 (least Sect. Mod.) = 18.1 IN.^{3}

$f_b = \frac{27950 \times 12}{18.1} = 18,530$ PSI



STATE OF LOUISIANA
CHARLES L. SLOAN
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PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING

Old Bruning, Inc. 80232 Form 8085

C. L. Sloan Engineering, Inc.
Consulting Engineers
1905 LA Hwy. 59
Mandeville, LA 70448
Telephone (504) 626-8302
FAX (504) 624-8302

10/11/1994

FACSIMILE TRANSMISSION COVER SHEET

TO: USACOE **FAX NUMBER: 862-2471**
ATTN: Frank Vojkovich (COLMN-ED-FS) TELEPHONE NUMBER: 862-1034

Gentlemen:

Transmitted herewith for
___ approval
___ final approval & distribution
_x_ your information & use
_x_ your comments

are _1_ **print(s) of the following:**

Calculation Sheets 1 & 2 of 2

Comments:

Very truly yours,

C. L. Sloan, PE

CLS/js

Number of pages (including cover sheet) _3_

If you had any problems receiving this transmission, please call (504) 626-8302.

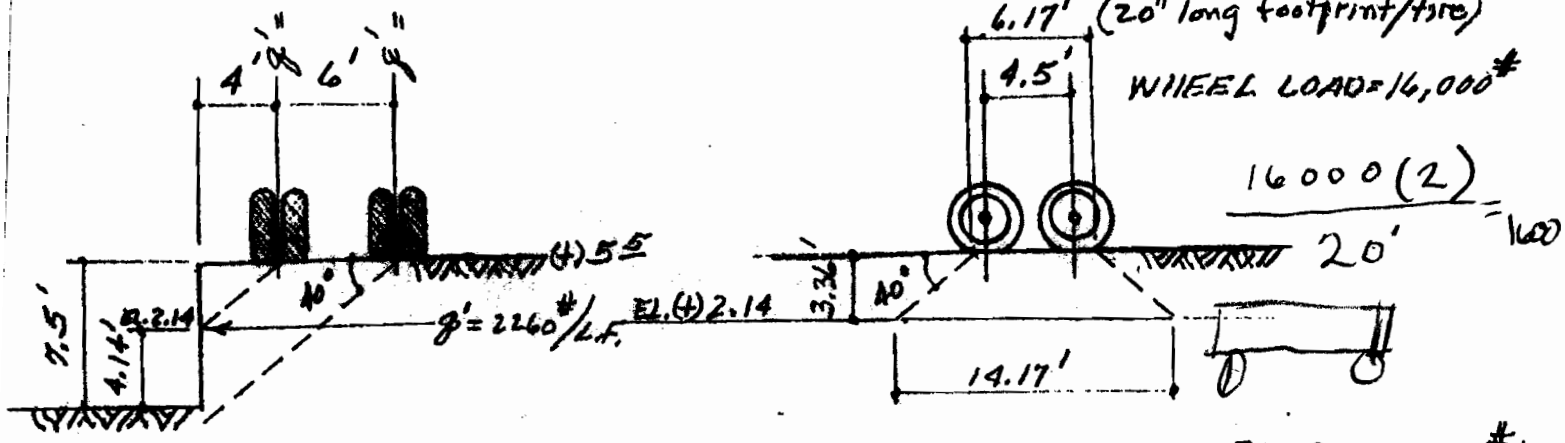
FILE

C.L. SLOAN ENGINEERING **MANDEVILLE, LOUISIANA**

BY _____ DATE 10-11-94 SUBJECT RAMP SHEET NO. 1 OF 2

CHKD. BY _____ DATE _____ CLIENT B&K JOB NO. _____

REF. BORING 62 (BORINGS 25 & 26 INDICATE BETTER SOIL)



INTENSITY @ EL.(+)2.14 = $\frac{32000}{14.1417}$ = 2259 #/L.F.

USE 2260

DEPTH OF SAMPLE	γ	q_u	C		
					(+)5±
2.0'	105.5	1475	100	737.5	(+)3.1
5.0'	76.5	625	400	312.5	(+)0.2
8.0'	106.6	390	280	195.0	(-)2.3
44.0'	102.1	1515		757.5	

Av. γ = 95 pcf
Av. C = 365 psf
} 5± to (-)2.3

Below (-)2.3: γ = 102 pcf
C = 758 psf 100

Sloan soil boring near site

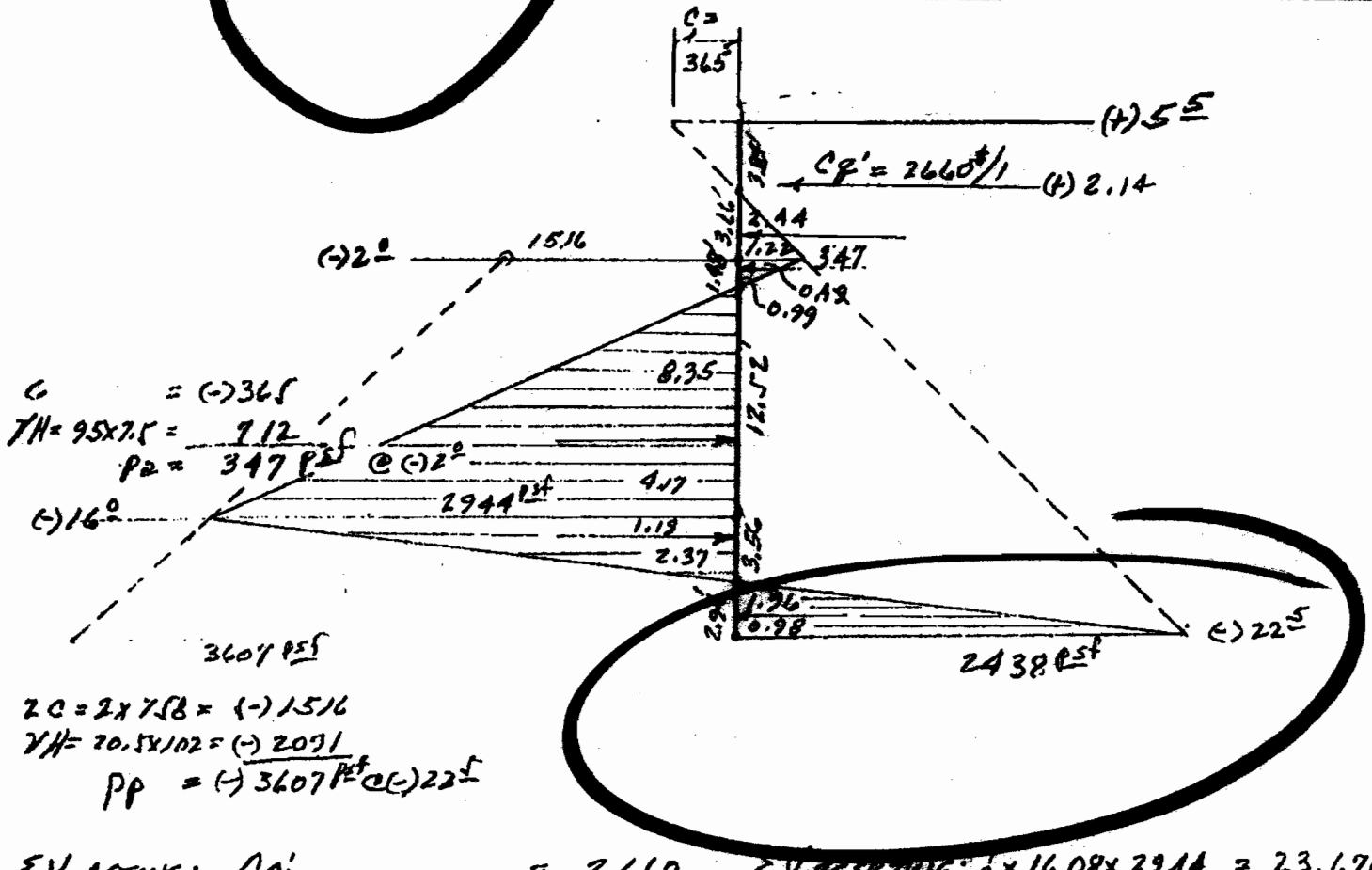
Frank used GPR

all of borings in area

C.L. SLOAN ENGINEERING **MANDEVILLE, LOUISIANA**

BY _____ DATE 10-11-94 SUBJECT RAMP SHEET NO. 2 OF 2

CHKD. BY _____ DATE _____ CLIENT BEK JOB NO. _____



C = (-)365

γH = 95x7.5 = 712 psf @ (-)2°

p2 = 347 psf

2944 psf

2C = 2x758 = (-)1516

γH = 20.5x102 = (-)2091

pp = (-)3607 psf @ (-)22.5°

ΣV ACTING: Cq' = 2660

½ x 5.14 x 347 = 892

½ x 7.94 x 2438 = 3584

7136

ΣV RESISTING: ½ x 16.08 x 2944 = 23,670

> 7136

F/S = 3.3 ok

ΣM ACTING; 2660 x 24.64 = 65542

½ x 3.66 x 347 x 20.74 = 13170

½ x 1.18 x 347 x 19.03 = 4887

83,599 #'/LF

ΣM RESISTING:

½ x 12.52 x 2944 x 9.69 = 178 581

½ x 3.56 x 2944 x 4.33 = 22 691

201,272 #'/LF

F/S = 2.4 ok

INCLUDE Cq' FROM OUTSIDE WHEELS:

INTENSITY @ EL.(-) 2.89 = 32000 / 26.17 = 1223 #/LF

M = 21.61 x 1223 = 26,429

83,599

110,028 #'/LF F/S = 201 272 / 110,028 = 1.8 ok

Ramp tip @ -22.5 (OK)

Soil not going to reach up to feet.

$\Sigma F_H = 0$

$\Sigma M = 0$

EV, M

Tangent –

Angle – is there an extra copy?

C.L. SLOAN ENGINEERING — MANDEVILLE, LOUISIANA

BY _____ DATE 10-21-94 SUBJECT RAMP SHEET NO. 1 OF 1

CHKD. BY _____ DATE _____ CLIENT BEK JOB NO. _____

USE THIS SHEET IN CONJUNCTION WITH SHEETS 1 & 2 of 2 DATED 10-11-94.

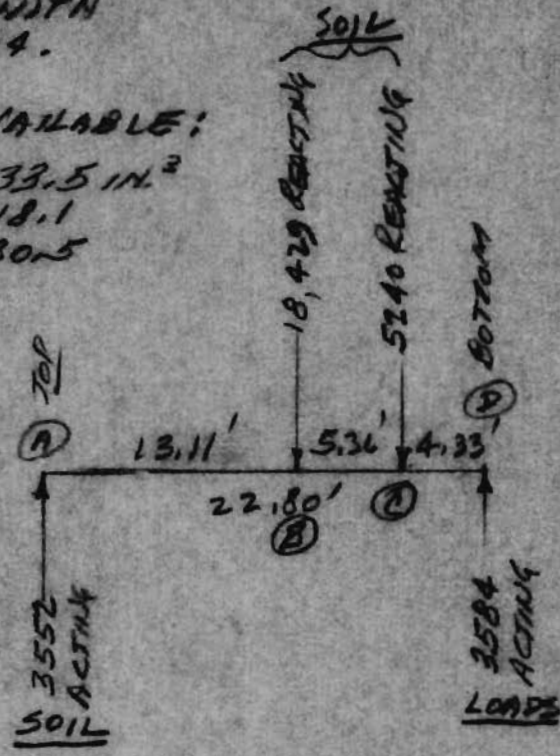
THE FOLLOWING PILE SECTIONS ARE AVAILABLE:

AZ 18 SECT. MOD. PER FT. OF WALL = 33.5 IN.^{3}
PZ 22 _____ = 18.1
RZ-10 _____ = 30.5

RESOLVE LOADING DIAG. (SH. 2) TO CONCENTRATED LOADS:

$\frac{1}{2} \times 2438 \times 2.94 = 3584$ #/1 @ -0-
$\frac{1}{2} \times 3.56 \times 2944 = 5240$ @ 4.33'
$\frac{1}{2} \times 12.52 \times 2944 = 18,429$ @ 9.69'

$\frac{1}{2} \times 1.48 \times 347 = 257$ @ 19.03'
$\frac{1}{2} \times 3.66 \times 347 = 635$ @ 20.74'
2660 @ 23.66'



SINCE THE SOIL WILL REACT ONLY TO THE EXTENT IT MUST THE SOIL REACTION VALUES WILL BE REDUCED FROM THOSE SHOWN -

$\Sigma V = 0$; (B) & (C) WILL HAVE THE SAME RELATIVE VALUES:

(C) = P $B = \frac{18429}{5240} P = 3.52P$

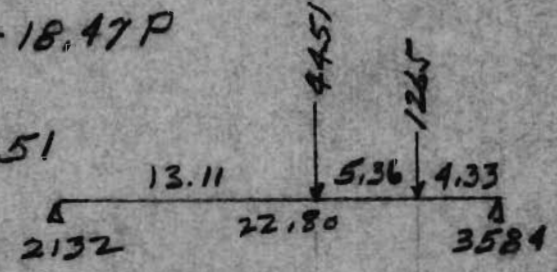
$R_A = 3581 - 4.52P$

$\Sigma M = 0$; $22.80 \times 3584 = 13.11 \times 3.52P + 18.47P$

$64.62P = 81,716$

$P = 1265$ $3.52P = 4451$

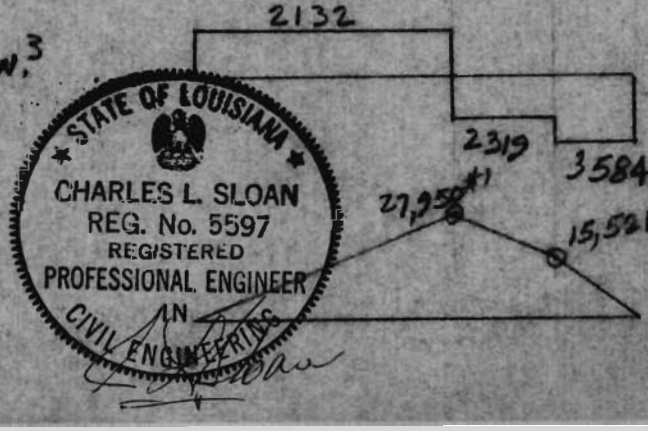
$R_A = 3581 - 4.52 \times 1265 = 2132$



$M_{max.} = 27,950$ #'

Use PZ 22 (least Sect. Mod.) = 18.1 IN.^{3}

$f_b = \frac{27950 \times 12}{18.1} = 18,530$ PSI ok



STATE OF LOUISIANA
CHARLES L. SLOAN
REG. No. 5597
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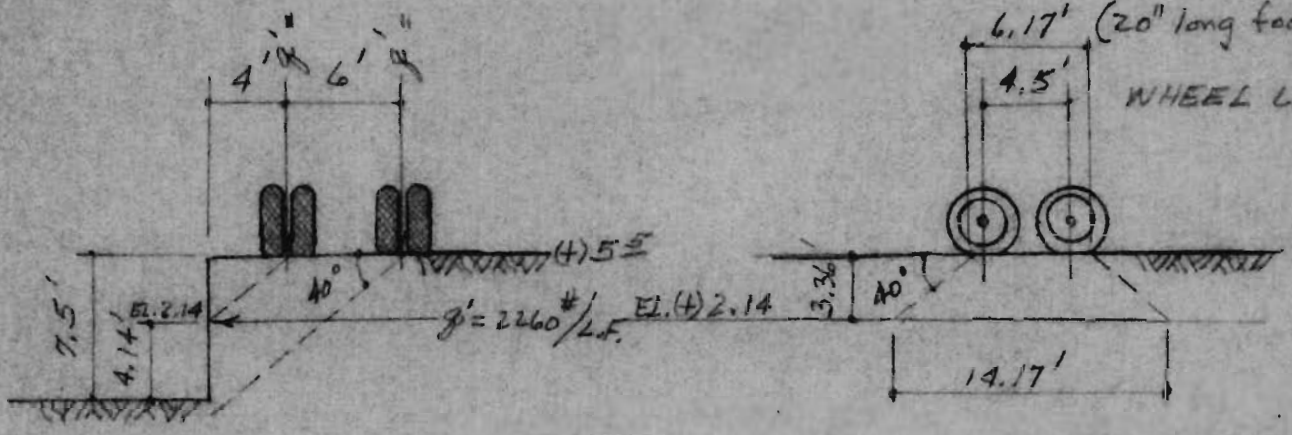
CIVIL ENGINEERING

C.L. SLOAN ENGINEERING — **MANDEVILLE, LOUISIANA**

BY _____ DATE 10-11-94 SUBJECT RAMP SHEET NO. 1 OF 2

CHKD. BY _____ DATE _____ CLIENT BEK JOB NO. _____

REF. BORING 62 (BORINGS 25 & 26 INDICATE BETTER SOIL)



INTENSITY @ El. (+) 2.14 = $\frac{32000}{14.1667}$ = 2259 #/L.F.

USE 2260

DEPTH OF SAMPLE	γ	ϕ_u	C	
				(+)5±
2.0'	105.5	1475	737.5	
				(+)3
5.0'	76.5	625	312.5	
				(+)0
8.0'	106.6	390	195.0	
				(-)2±
44.0'	102.1	1515	757.5	

AV. γ = 95 pcf
AV. C = 365 psf
} 5± to (-)2±

Below (-)2±: γ = 102 pcf
C = 758 psf

STATE OF LOUISIANA
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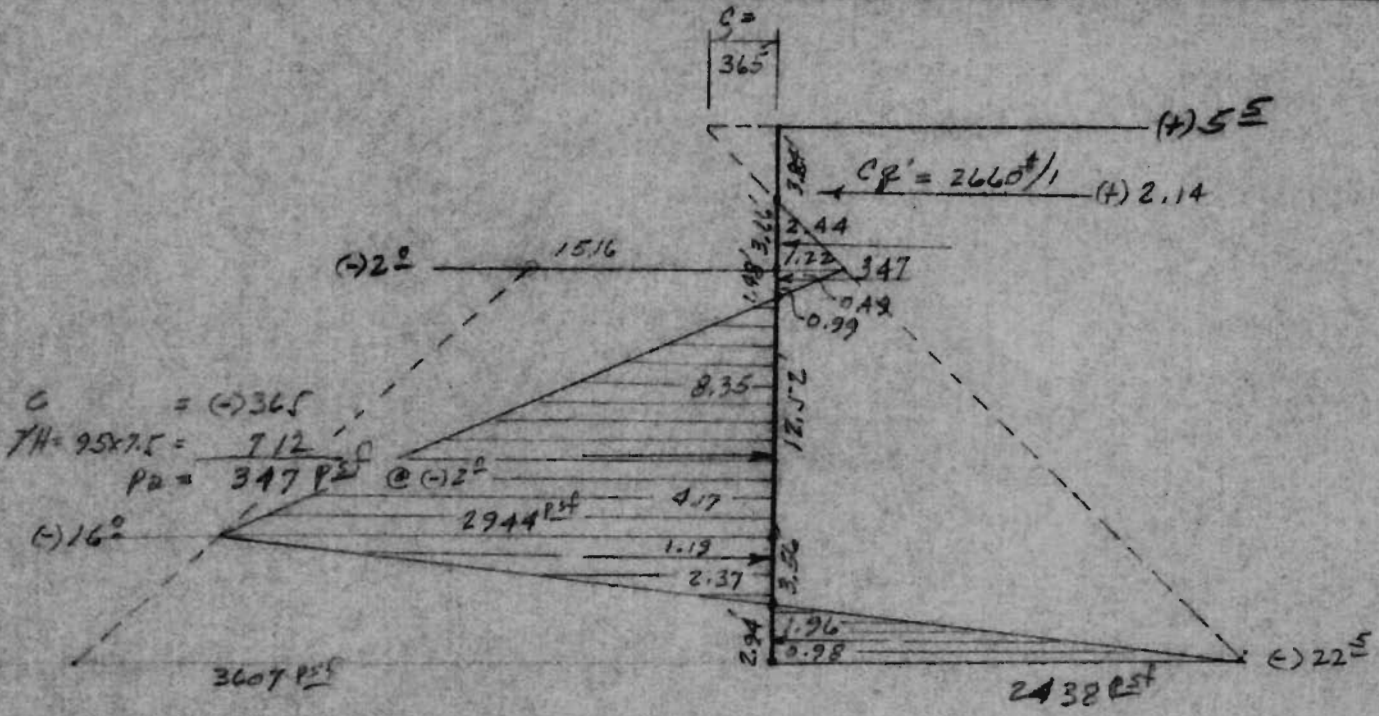
C. L. Sloan

C.L. SLOAN ENGINEERING — MANDEVILLE, LOUISIANA

BY _____ DATE 10-11-94 SUBJECT RAMP SHEET NO. 2 OF 2

CHKD. BY _____ DATE _____ CLIENT BEK JOB NO. _____



C = (-)365

YH = 95×7.5 = 712

Pa = 347 #/sf @ (-)2°

ΣC = 2×758 = (-)1516

YH = 20.5×102 = (-)2091

Pp = (-)3607 #/sf @ (-)22.5°

EV ACTING: CQ' = 2660

½×5.14×347 = 892

½×7.94×2438 = 3584

7136

EV RESISTING: ½×16.08×2944 = 23,670

> 7136

F/S = 3.3 ok

EM ACTING; 2660 × 24.64 = 65542

½×3.66×347 × 20.74 = 13176

½×1.48×347 × 19.03 = 4887

83,599 #/LF

EM RESISTING:

½×12.52×2944 × 9.69 = 178581

½×3.56×2944 × 4.33 = 22691

201,272 #/LF

F/S = 2.4 ok

INCLUDE CQ' FROM OUTSIDE WHEELS:

INTENSITY @ EL.(-) 2.89 = 32000 / 24.17 = 1223 #/LF

M = 21.61×1223 = 26,429

83,599

110,028 #/LF

F/S = 201272 / 110,028 = 1.8

STATE OF LOUISIANA
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CIVIL ENGINEERING

C.L. Sloan

C.L. SLOAN ENGINEERING — MANDEVILLE, LOUISIANA

BY CLS DATE 9-22-94 SUBJECT RAMP SHEET NO. 1 OF 2

CHKD. BY ____ DATE ____ CLIENT B&K JOB NO. ____

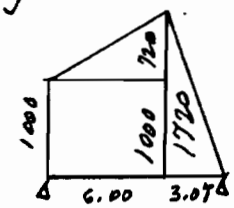
DEPTH	ELEV		C	
-0-	5.5			
4	9.5	V. COMPACT TAN GRAY CLAYEY SILT	2000 psf	} AV. 1550 for top 6'
7	12.5	D. TAN GRAY CLAYEY SAND	1000	
10	15.5	S. GRAY SILTY CLAY	300	} AV. 900 for next 16'
13	18.5	M. SI. DK. GRAY CLAY	1000	
17	23.0	SI. BR. ORG. CLAY	1500	
20	25.5	S. GRAY SILTY CLAY	400	

EQUIP. SURCHG. 1000 psf

$\gamma = 120$ (assumed)

$2C = 2 \times 900 = 1800$

$\gamma H = 120 \times 16 = 1920$ } 3720



EQUIV. BEAM

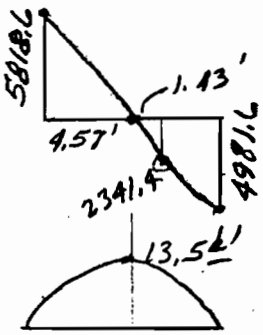
Use steel sheets

PZ-22 (lightest)

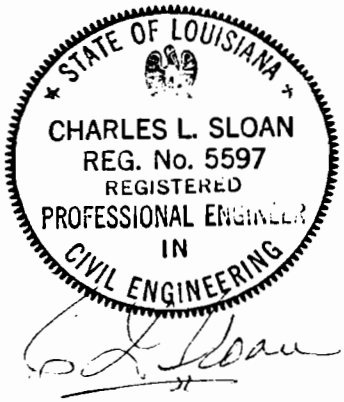
$I = 18.1$ in^3

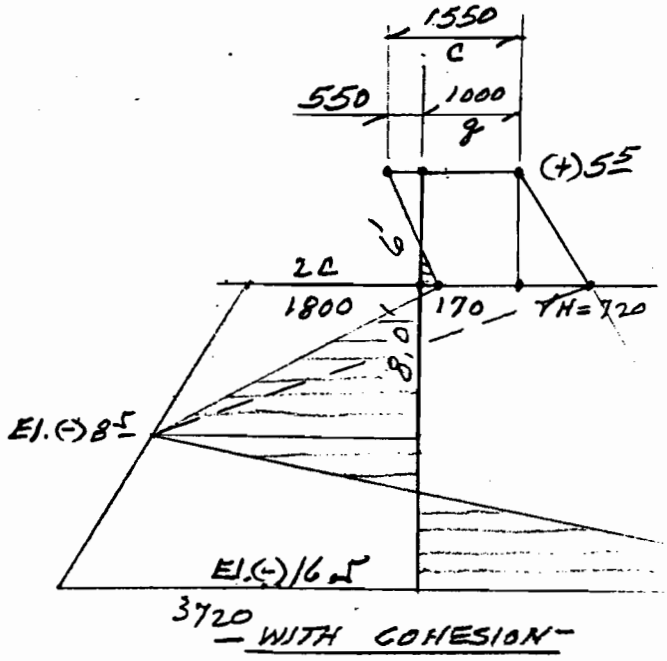
$f = \frac{13.5 \times 12}{18.1} = 8.9$ ksi

ok

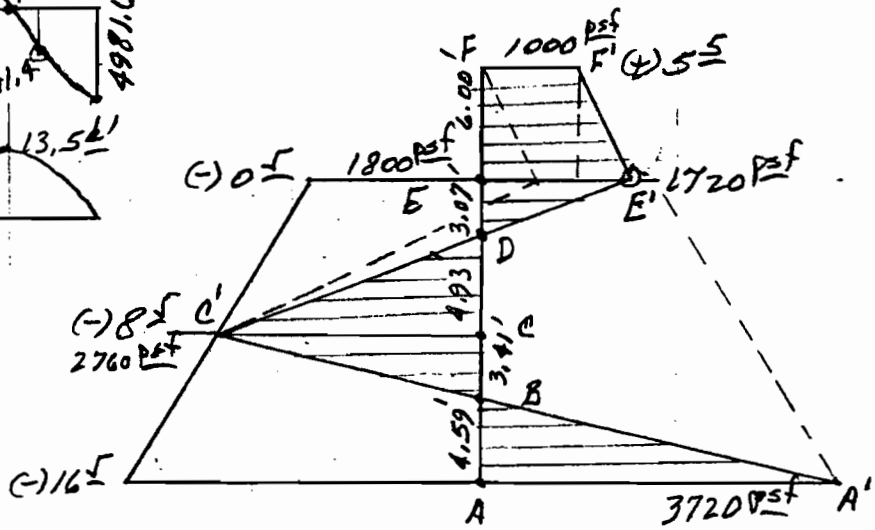


WITHOUT COHESION REPRESENTS WORST CONDITION FOR SHEET PILE STRESSES.





— WITH COHESION —



— COHESION OMITTED —

C.L. SLOAN ENGINEERING — MANDEVILLE, LOUISIANA

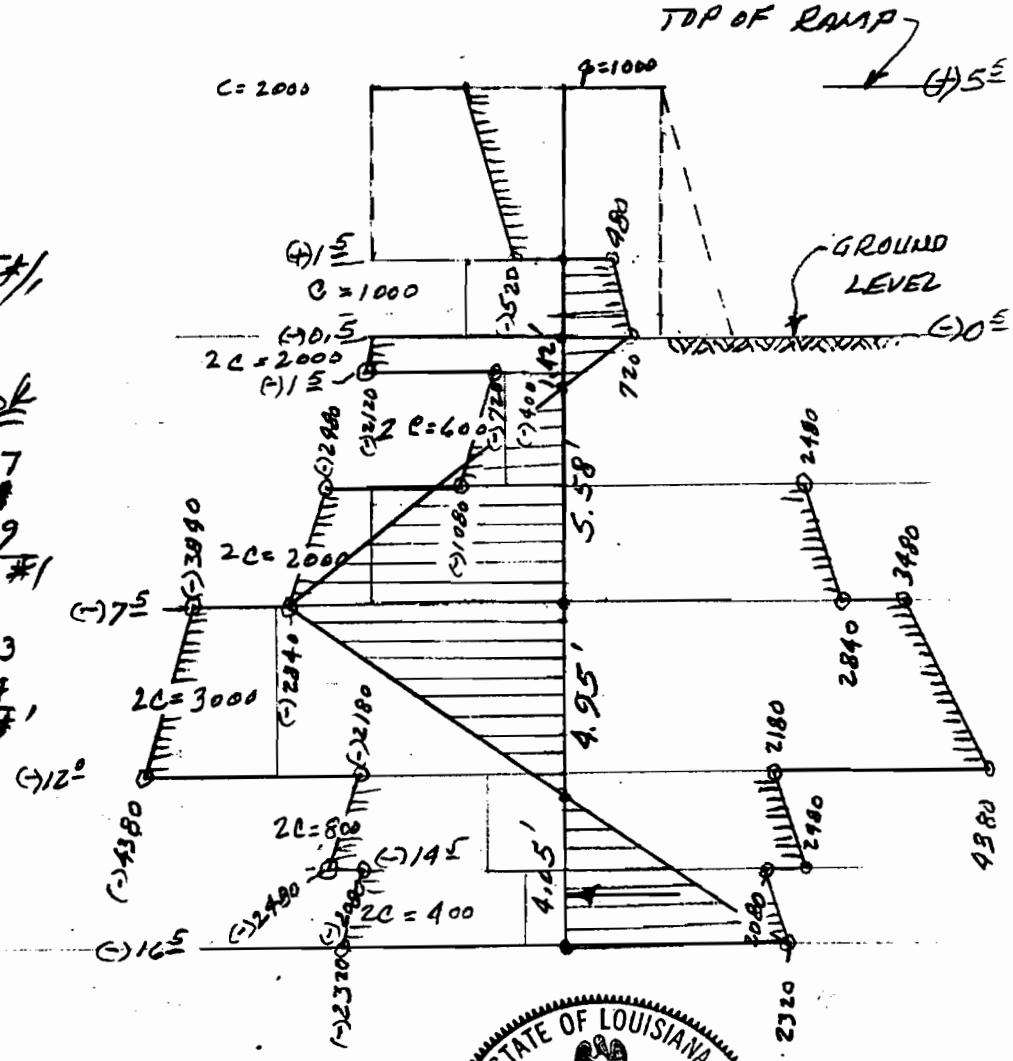
BY CLS DATE 9-22-94 SUBJECT RAMP SHEET NO. 2 OF 2

CHKD. BY ____ DATE ____ CLIENT B&K JOB NO. ____

ELEV.	DESCRIPTION	COHESION	REF: BORING #11
(+) 5.5 TO (+) 1.5	V. Compact tan gray clayey silt	2000 psf	} use 3V.
(+) 1.5 TO (-) 1.5	Dense tan gray clayey sand	1000	
(-) 1.5 TO (-) 4.5	Soft Gray silty clay	300	
(-) 4.5 TO (-) 7.5	Med. stiff dark gray clay	1000	
(-) 7.5 TO (-) 12.0	stiff brown org. clay	1500	
(-) 12.0 TO (-) 14.5	soft gray silty clay	400	
(-) 14.5 TO (-) 20.5	V. loose gray silty clayey sand	200	

Assume $\gamma = 120$ pcf

$q = 1000$ psf



$\frac{480+720}{2} \times 2 = 1200$

$\frac{1}{2} \times 720 \times 1.42 = 511$

$\frac{1}{2} \times 2320 \times 4.05 = 4698$

6409 #/

$\frac{1}{2} \times 2840 \times 10.53 = 14,953$

$F/S = \frac{14,953}{6409} = 2.3$ ok

$240 \times 2 \times \frac{1}{2} \times 15.32 = 3677$

$480 \times 2 \times 15.45 = 15,024$

$720 \times 1.42 \times \frac{1}{2} \times 14.18 = 7249$

overturn $M_o = 25,950$ #/

$2840 \times 5.58 \times \frac{1}{2} \times 9.51 = 75,353$

$2840 \times 4.95 \times \frac{1}{2} \times 6.00 = 42,174$

Restrain $M_o = 117,527$ #'

$F/S = \frac{117,527}{25,950} = 4.5$ ok

STATE OF LOUISIANA
CHARLES L. SLOAN
REG. No. 5597
REGISTERED
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING

C. L. Sloan

TEMPORARY ACCESS ROAD

London Avenue Canal

We propose to add fill taken from the road base on our West Napoleon Project in Metairie to the existing levee to widen the crown from the existing wall out to 12' to allow access with our 20 ton crane and concrete trucks. We will scarify the existing levee surface prior to placment of the fill. The finished dirt surface will be sloped to drain toward the landside. We have calculated that we will be adding approximately 5000 CY of dirt over the 10,000 LF job. The outside slope of the road will not be steeper than 1 vertical on 1.5 horizontal. In certain areas, such as the south side of Robert E. Lee on the east baseline, because of the narrowness of the access we will drive steel sheets as per sketch attached. We have enclosed the Registered Engineers calculations on the sheet pile ramp. We have also enclosed 2 reports from the State Dept of Agriculture on the sandy loam material excavated from the W. Napoleon Job along with a sieve analysis and atterburg of the same material from Eustis Engineers, Inc. of New Orleans.

If conditions warrant, we will be adding geotextile fabric over this road after construction of the new I-wall and then topping it off with broken asphalt about 6" thick. This should allow all-weather access.

In the following stations we will be adding crushed asphalt over geotextile fabric instead of earth fill:

W/BL

Approx sta 70+00 to 77+00
101+00 to 103+00
108+00 to 110+00
112+00 to 115+80

E/BL

Approx sta 71+50 to 83+00
86+50 to 99+50

Upon completion of a section of levee I-wall, the asphalt and geotextile fabric will be removed, the levee shaped to its final grades and the material hauled off and disposed of in approved dumpsites.

EUSTIS ENGINEERING COMPANY, INC.
GEOTECHNICAL ENGINEERS
CONSTRUCTION QUALITY CONTROL AND MATERIALS TESTING
3011 28th Street • Metairie, Louisiana 70002 • 504-834-0157

2 May 1994

Post-it™ Fax Note 7671	Date 9/21/94	# of pages ▶ 3
To Jimmy	From Chris	
Co./Dept. B+O K	Co.	
Phone #	Phone #	
Fax #	Fax #	

Jefferson Parish
Department of Public Works
Suite 802
1221 Elmwood Park Boulevard
Harahan, Louisiana 70123

Attention Mr. Jose Gonzalez

Gentlemen:

Results of Soil Mechanics Laboratory Tests
Jefferson Parish
West Napoleon Avenue Improvements
Houma Boulevard to Harvard Avenue
Jefferson Parish, Louisiana
JPPW No. 90-009-RB
SP No. 742-07-42

On 25 April 1994, a representative of Eustis Engineering Company, Inc., obtained a sack sample of sand from the project site. The sand is intended for use as topsoil material.

Jefferson Parish
Department of Public Works

2 May 1994

One grain size analysis was performed on the sand as shown on the enclosure. This test indicated the material was in compliance with the project specifications.

Should you require any additional information, please do not hesitate to contact us.

Yours very truly,

EUSTIS ENGINEERING COMPANY, INC.

Lloyd F. Held, Jr

LLOYD A. HELD, JR., P.E.

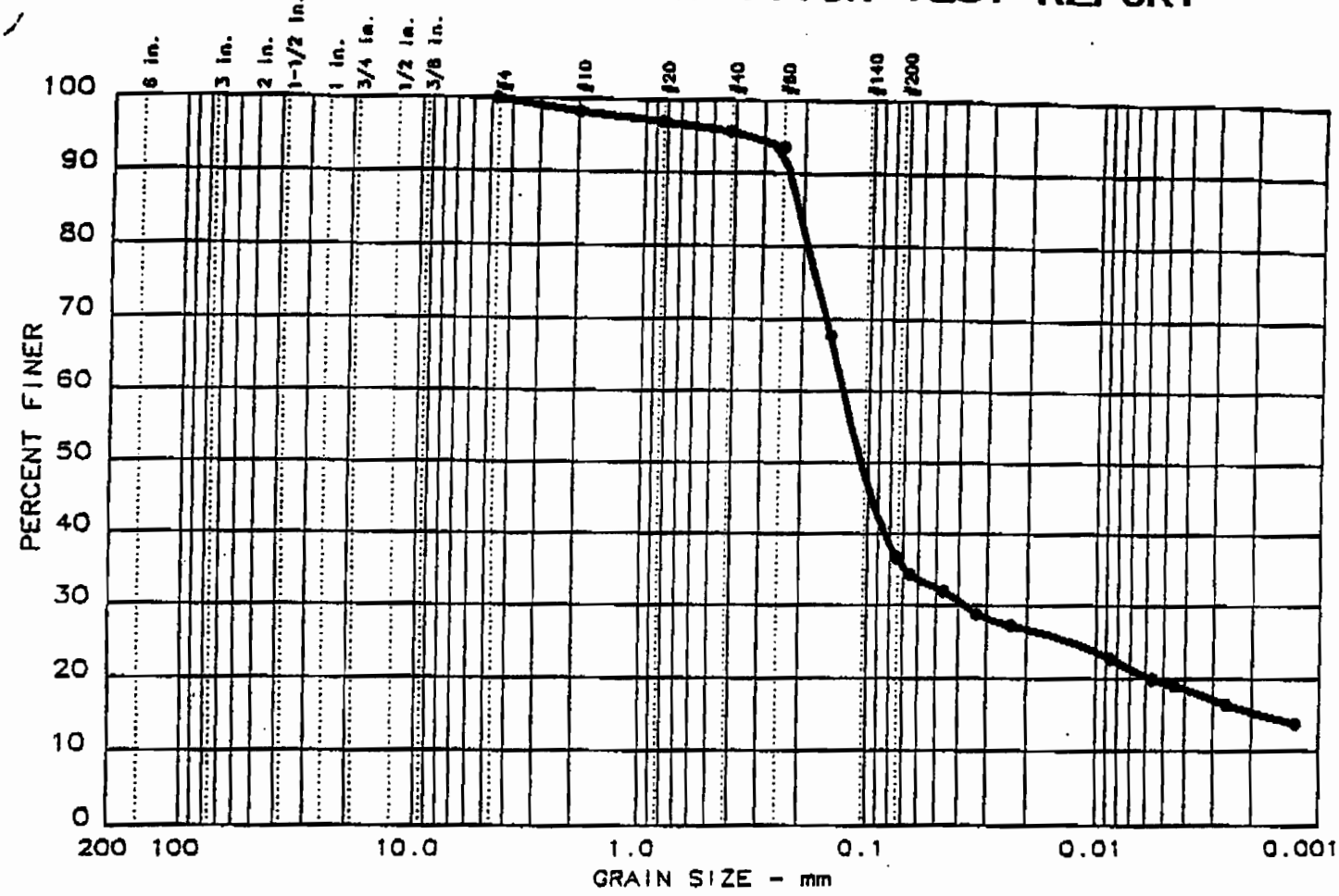
LAH:cr

EE 12210

Enclosure

xc J. J. Krebs and Sons, Inc., Mr. Bill Haensel; B & K Construction Company

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PI
●	0.0	0.0	63.4	17.1	19.5	A-7-6	41	24

SIEVE inches size	PERCENT FINER ●		
	GRAIN SIZE		
D_{60}	0.13		
D_{30}	0.04		
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ●
4	100.0
10	98.2
20	97.0
40	95.8
60	93.6
100	67.8
200	36.6

Sample information:
● Sack
Dk G Clayey Sand
w/silt & shell frag

Remarks:
● Sampled 4-25-94
pH = 7.38

Eustis Engineering Company, Inc.

Project No.: 12210
Project: West Napoleon Avenue Improvements
Date: 4-27-94 Data Sheet No. ——

Louisiana State University
Agricultural Center

Division of Plant Science
Louisiana Cooperative Extension Service

Department of Agronomy
Louisiana Agricultural Experiment Station

128 Madison B. Sturgis Hall
Baton Rouge, LA 70803
(504) 388-1261

Soil Test Results

Date Sampled: / / Date Received: 08/24/94 Date Completed: 09/07/94

A. Elkins
3011 28th Street
Metairie LA 70002 Parish: Jefferson

Lab Number: 11477.1 Sample Identification: #2

Soil Area: Upland Texture: very fine sandy loam

SOIL TEST RESULTS AND INTERPRETATIONS:

	Results	Interpretation
pH	9.4	very high
Phosphorus, ppm	90	high
Sodium, ppm	22	very low
Potassium, ppm	37	very low
Magnesium, ppm	29	very low
Calcium, ppm	4373	high
Bases, meq/100g	22.3	
Organic Matter, %	0.41	

RECOMMENDATIONS:

		Nutrients Needed, lb/1000 sq. ft.		
Crop	Irrigate?	Nitrogen	Phosphate	Potash
Bermudagrass (sod and lawns)	yes			
maintain		See Sheet	0	2.3
establish		See Sheet	0.7	2.8

CONTACT YOUR COUNTY AGENT (TELEPHONE 504/838-1170) IF YOU HAVE ANY QUESTIONS ABOUT THIS REPORT. THE AGENT ALSO RECEIVES A COPY OF THIS REPORT AND MAY CONTACT YOU TO DISCUSS IT.
Enclosure: T 610

Louisiana State University
Agricultural Center

Division of Plant Science
Louisiana Cooperative Extension Service

Department of Agronomy
Louisiana Agricultural Experiment Station

128 Madison B. Sturgis Hall
Baton Rouge, LA 70803
(504) 388-1261

Soil Test Results

Date Sampled: / / Date Received: 08/24/94 Date Completed: 09/07/94

A. Elkins
3011 28th Street
Metairie LA 70002 Parish: Jefferson

Lab Number: 11476.1 Sample Identification: #1

Soil Area: Upland Texture: very fine sandy loam

SOIL TEST RESULTS AND INTERPRETATIONS:

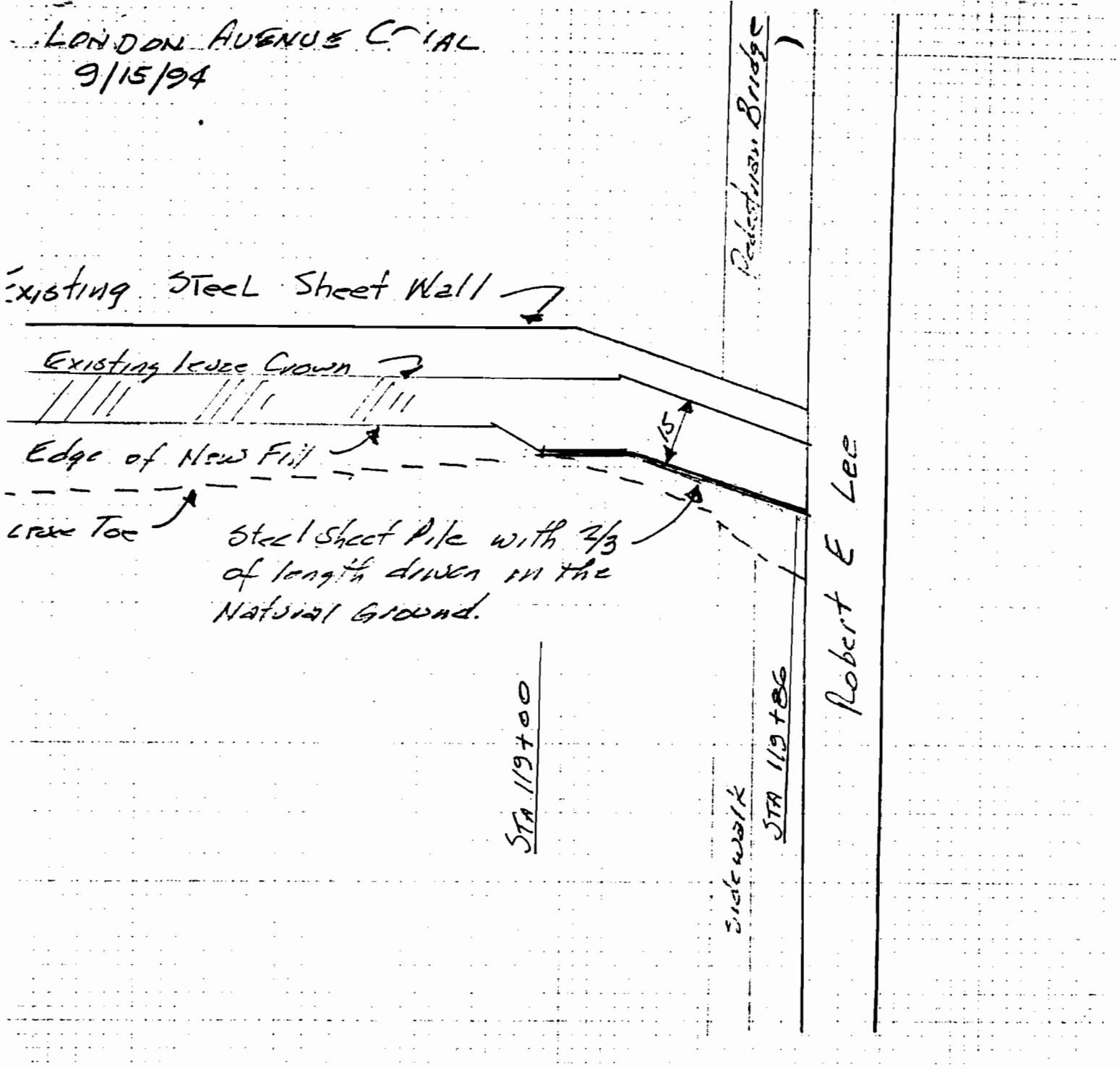
	Results	Interpretation
pH	8.9	very high
Phosphorus, ppm	97	very high
Sodium, ppm	26	very low
Potassium, ppm	49	very low
Magnesium, ppm	61	low
Calcium, ppm	4680	high
Bases, meq/100g	24.1	
Organic Matter, %	0.72	

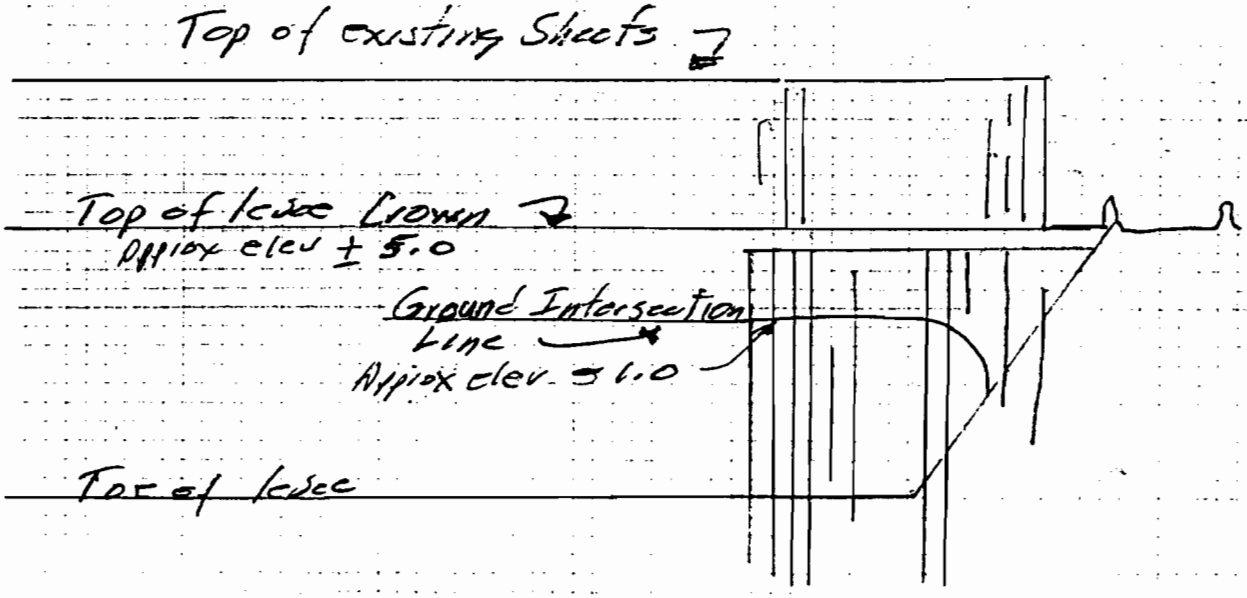
RECOMMENDATIONS:

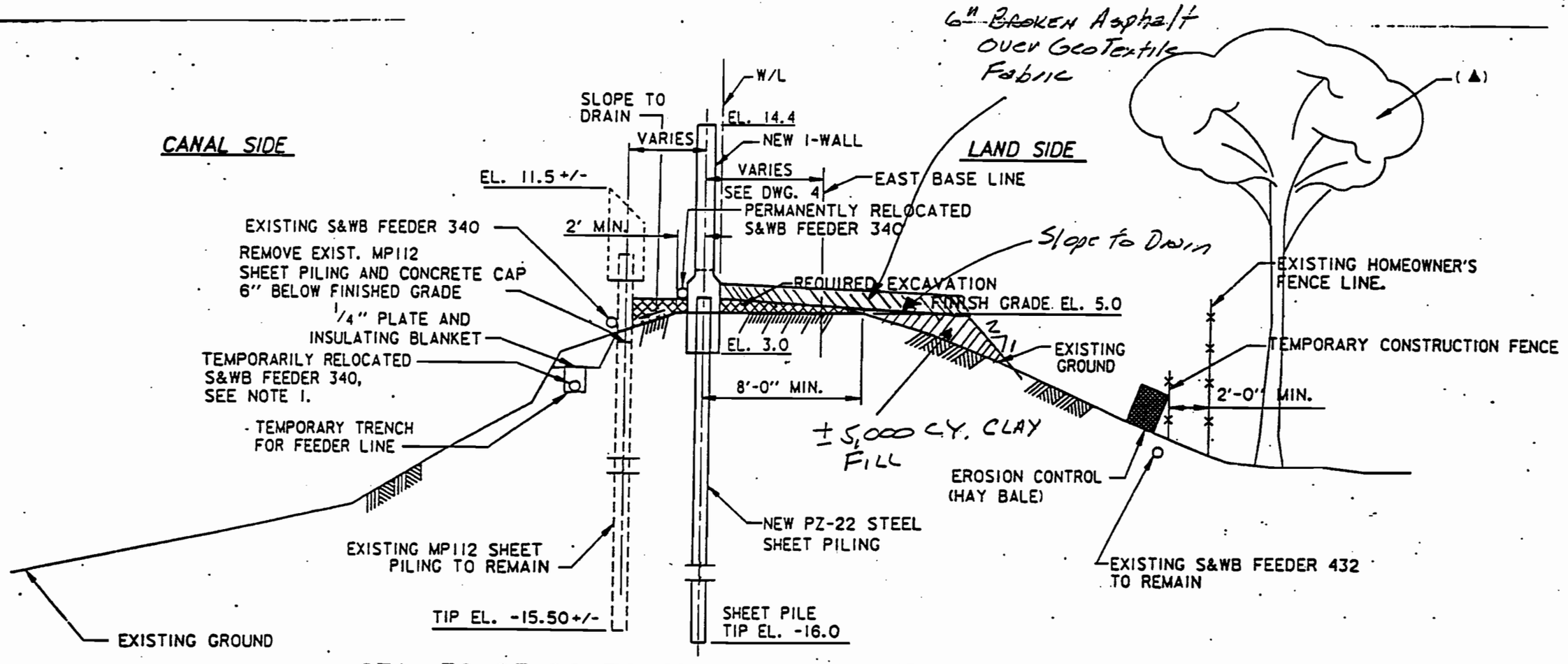
		Nutrients Needed, lb/1000 sq. ft.		
Crop	Irrigate?	Nitrogen	Phosphate	Potash
Bermudagrass (sod and lawns)	yes			
maintain		See Sheet	0	2.3
establish		See Sheet	0	2.8

CONTACT YOUR COUNTY AGENT (TELEPHONE 504/838-1170) IF YOU HAVE ANY QUESTIONS ABOUT THIS REPORT. THE AGENT ALSO RECEIVES A COPY OF THIS REPORT AND MAY CONTACT YOU TO DISCUSS IT.
Enclosure: T 610

LONDON AVENUE C'IAL
9/15/94



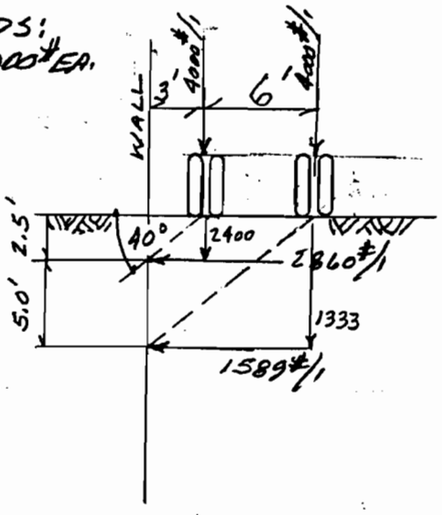


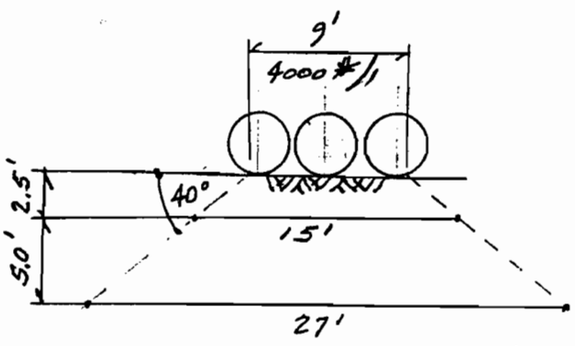


STA. 72+95.00 TO STA. 84+31.10 EB/L

SCALE: 1/4" = 1'-0"

TRUCK LOADS:
3 AXLES @ 24,000# EA.



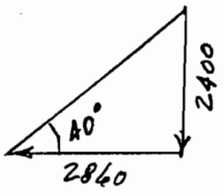


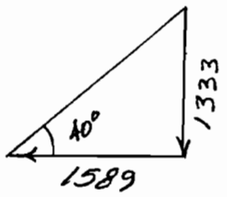
12k/wheel: $\frac{3\times12}{9} = 4^k/LF$

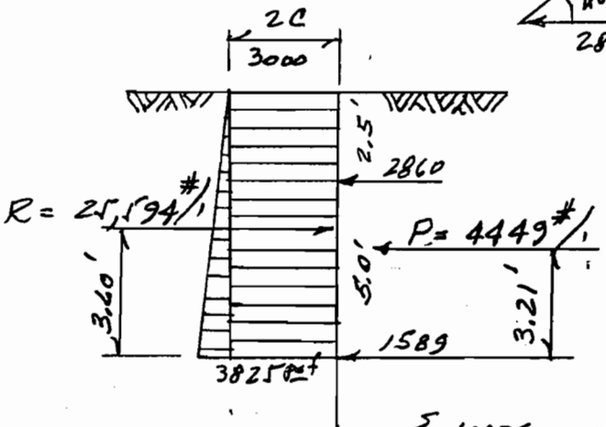
Intensity 2.5' down = $\frac{9\times4000}{15} = 2400\#/LF$

Intensity 7.5' down = $\frac{9\times4000}{27} = 1333\#/LF$

C = 1500 psf (av.)
γ = 110 pcf (min.)







$2860 \times 5 = 14{,}300$
$1589 \times -0- = -0-$
$4449 \times 3.21' = 14{,}300$

$\frac{1}{2}\times825\times7.5 = 3094 \times \frac{7.5}{3} = 7734$
$3000\times7.5 = 22\,500 \times \frac{1}{2}\times7.5 = 84\,325$
$25{,}594 \times 3.60 = 92{,}109$

Σ LOADS = 4449#/'
Σ RESISTING FORCES = 25,594#/' > 4449 o.k.
F/S = 5.75

STATE OF LOUISIANA
CHARLES L. SLOAN
REG. No. 5597
REGISTERED
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING

- TRUCKS SHOULD PRESENT NO PROBLEMS TO THE SHEETPILE WALL -

- SINCE THE EARTH IS APPROXIMATELY THE SAME ELEVATION ON BOTH SIDES OF THE WALL, THERE IS NO DIFFERENTIAL LOAD FROM THE EARTH -

LOADS: 2 AXLES @ 32,000 # EA. = 16 k/wheel

$\frac{2 \times 16}{4.5} = 7.111$ k/LF

Intensify 2.5' down = $\frac{4.5 \times 7111}{10.5} = 3048$ #/LF

Intensify 7.5' down = $\frac{4.5 \times 7111}{22.5} = 1422$ #/LF

HORIZ. LOADINGS: $\frac{3048}{\tan 40^\circ} = 3632$ #/'

$\frac{1422}{\tan 40^\circ} = 1695$ #/'

ENDRIE. LOADS: $3632 \times 5 = 18,160$

$1695 \times -0- = -0-$

$5327 \times 3.41' = 18,160$

Σ LOADS = 5327

Σ RESISTING FORCES (SH, 1) = 25,594 #/' > 5327 F/S = 4.8

ROUTING OF SHOP DRAWING, EQUIPMENT DATA, MATERIAL SAMPLES, & MANUFACTURER'S CERTIFICATES OF COMPLIANCE FOR APPROVAL

(Used to route ENG Form 4025 with items attached. Not to become a part of the Contractor's record.)

	TO:	FROM:	DATE
1	C/Const Div	Area Engineer, New Orleans	10/4/94

The attached items listed on ENG Form 4025 are forwarded for approval action.

CONTRACT NUMBER	CONTRACTOR
94-C-0079	B&K Const Co., Inc.
TRANSMITTAL NUMBERS # 29 Formwork design & shop dwgs	**PROJECT TITLE AND LOCATION** London Ave Canal Floodwall, Mirabeau to Leon C. Simon Blvd.

COMMENTS (Attach additional sheet, if necessary)
Request your office review the attached formwork design shop dwgs submittal for the subject contract. Furnish comments to NOAD by COB 14/19 Oct 94. POC is Chris Wagner x1222

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
1	Dennis Dubon, Supv Civ Engr	

	TO:	FROM:	DATE
2	C/Engr Div	C/Const Div	OCT 1994 10/11/94

COMMENTS (Attach additional sheet, if necessary)
Pls review & cmt by COB 19 Oct 94. POC is Jim Berry x1240

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
1	RICHARD T. HILL	

	TO:	FROM:	DATE
3	C/Const Div	C/Engr Div	10/17/94

COMMENTS (Attach additional sheet, if necessary)
Not recommended for approval. See attached comments

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
2	W. Eugene Tickner C/Engr Div	

	TO:	FROM:	DATE
4			

The following action codes are given to items listed on ENG Form 4025:

ACTION CODES

A - APPROVED AS SUBMITTED.

B - APPROVED, EXCEPT AS NOTED ON DRAWINGS. RESUBMISSION NOT REQUIRED.

E - APPROVED, EXCEPT AS NOTED ON DRAWINGS. REFER TO ATTACHED SHEET. RESUBMISSION REQUIRED.

D - WILL BE RETURNED BY SEPARATE CORRESPONDENCE.

E - DISAPPROVED (SEE ATTACHED)

F - RECEIPT ACKNOWLEDGED

G - OTHER (Specify)

ACTION CODES TO BE INSERTED IN COLUMN G, SECTION I, ENG FORM 4025 (Attach sheets, when required.)

ITEM NO. (Taken from ENG Form 4025)								
CODE GIVEN								

REMARKS

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE

ENG FORM 1 NOV 74 4026 EDITION OF NOV 66 MAY BE USED.

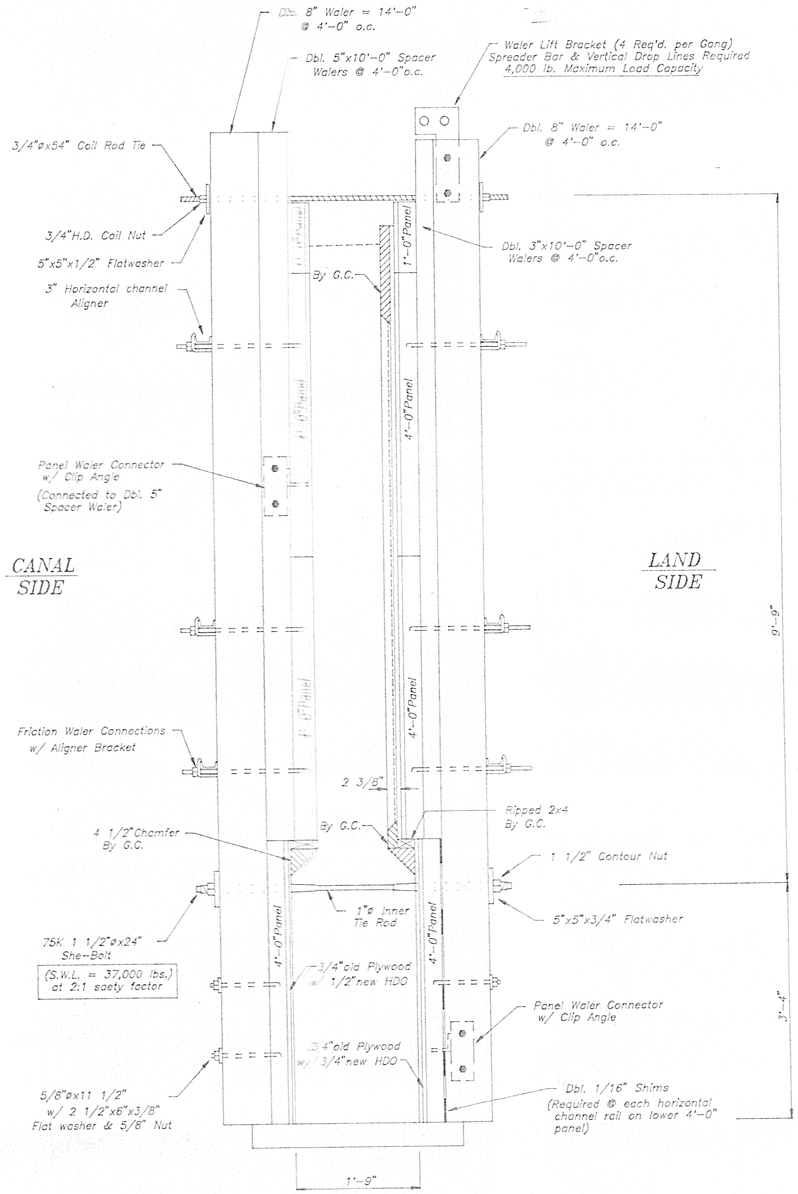
★U.S. G.P.O. 1983-521-246/393

Formwork Submittal

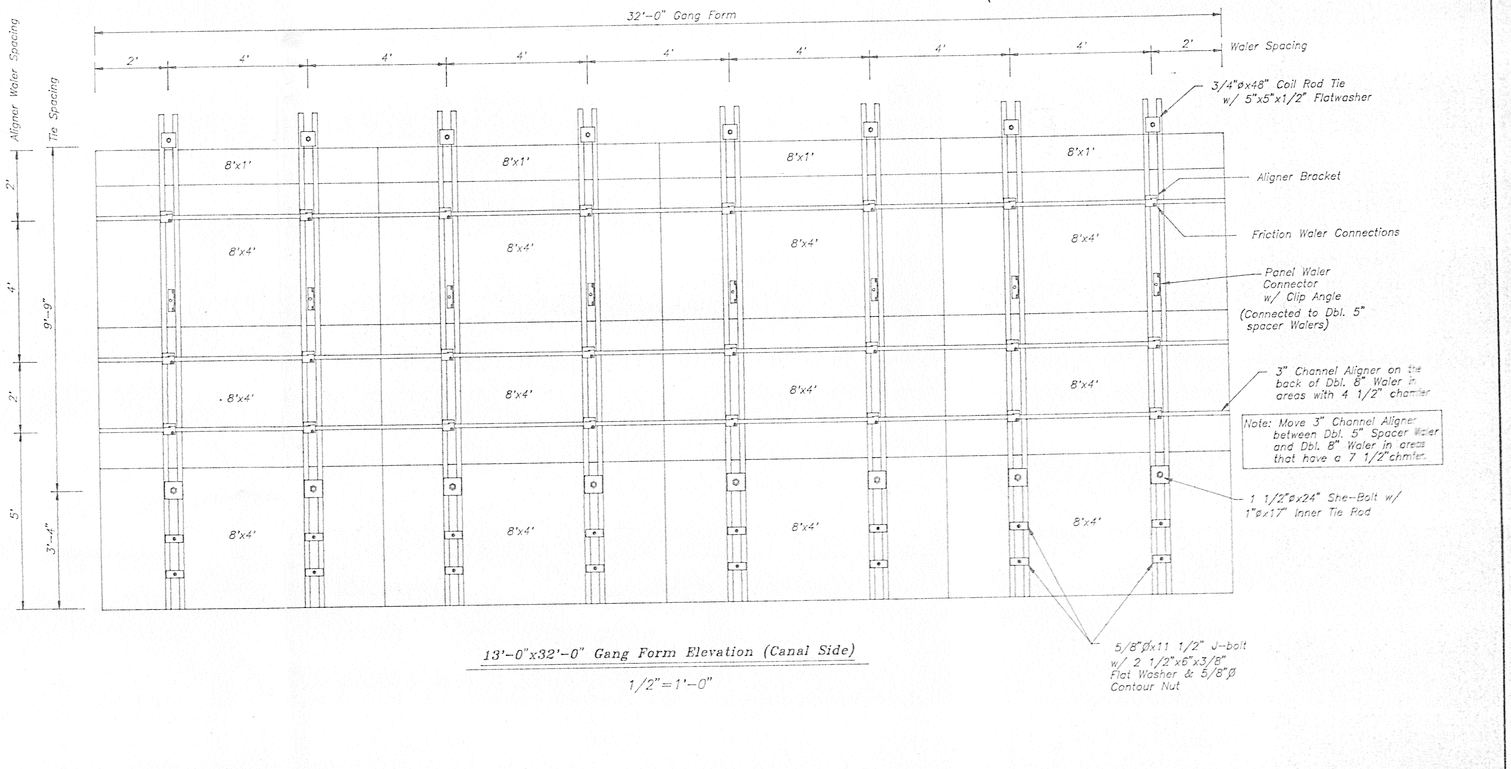
1. Complete calculations including loading diagram, shear and moment, maximum moment, and deflection calculations shall be required.

2. Section and material properties, and allowable stresses for all materials are required.

2. Manufacturer's literature for plyform, joists and beams, expansion joints, and waterstops shall be submitted according to the requirements of C3A-4.2.



SECTION (A)
1"=1'-0"



13'-0"x32'-0" Gang Form Elevation (Canal Side)
1/2"=1'-0"

WALLFORM DESIGN
Max. Design Pressure = 1000psf

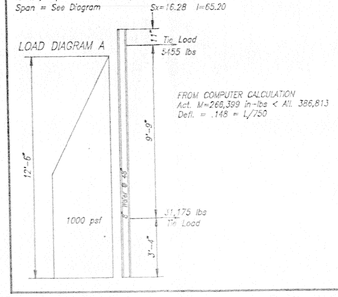
ALL LOADS CONSIDERED SHORT DURATION

3/4" HDO Plyform – Cont. Span
fb=2063psi E=1,800,000psi Allow M=941 in-lbs Allow Defl.=L/360
Clear Span = 10 1/2"
Allow Tot. Load = 1022psf > Act. 1000psf
Allow Defl. Load = 1510psf > Act. 1000psf

3" Versiform Stiffener @ 12" – Cont. Span
fb=23,760psi E=29,000,000psi Allow M=26,136 in-lbs Allow Defl.=L/360
Span = 48" (41" Clear) Sx=1.10 I=1.66
Allow Tot. Load = 1500plf > Act. 1000plf
Allow Defl. Load = 1500plf > Act. 1000plf

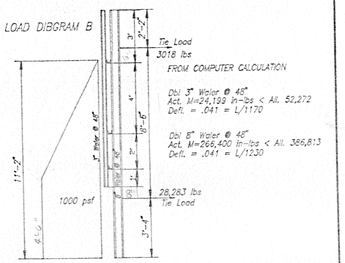
8" Versiform Waler @ 48"
fb=23,760psi E=29,000,000psi Allow M=386,813 in-lbs Allow Defl.=L/360
Span = See Diagram Sx=16.28 I=65.20

LOAD DIAGRAM A



3" Versiform Waler @ 48"
fb=23,760psi E=29,000,000psi Allow M=52,272 in-lbs Allow Defl.=L/360
Span = See Diagram Sx=2.20 I=3.32

LOAD DIBGRAM B



She-Bolt Ties
1 1/2" She-Bolts with 1" inner rods by Dayton-Superior
Allowable Load = 37,500 lbs > Actual Max Load of 31,175 lbs

MAXIMUM LATERAL PRESSURE FOR DESIGN OF WALL FORMS

Based on ACI Commitee 347 pressure formulas for placement at 10 ft per hour or less

NOTE: Do not use design pressures in excess of 150 X height of fresh concrete in forms.

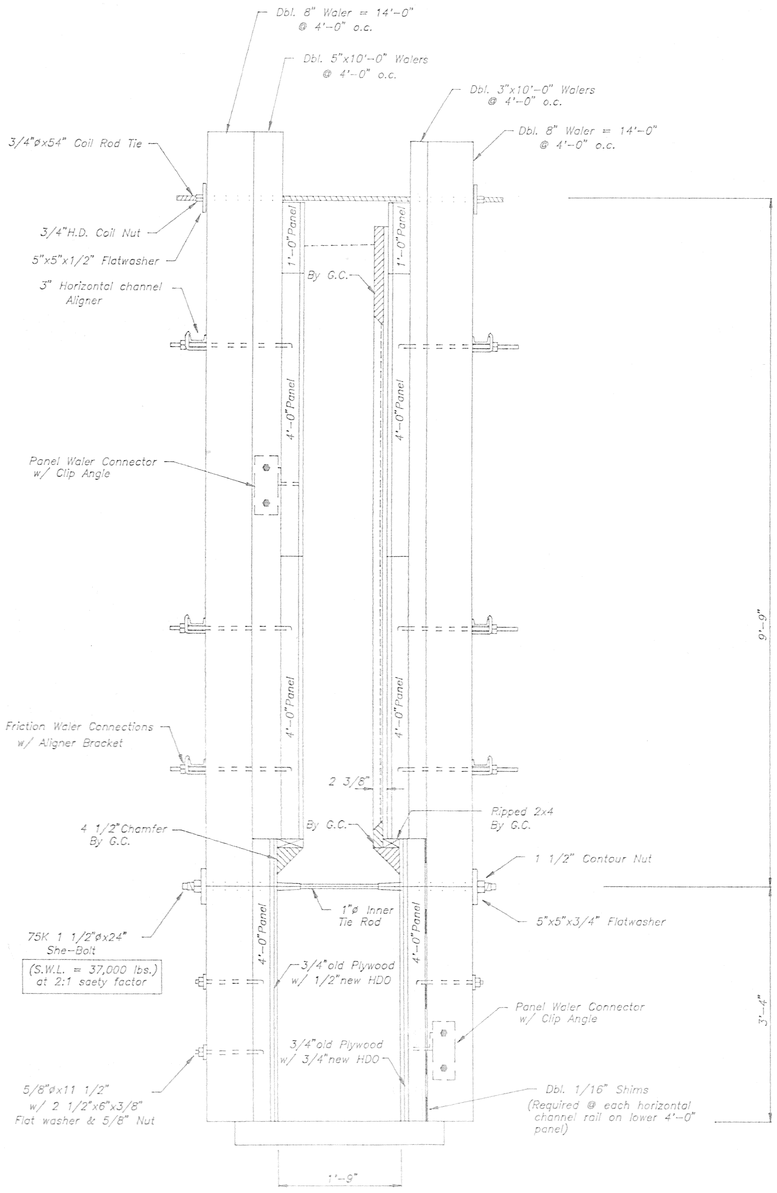
Rate of placement, R, ft per hr	p,maximum lateral pressure, psf, for temperature indicated					
	90F	80F	70F	60F	50F	40F
1	250	262	278	300	330	375
2	350	375	407	450	510	600
3	450	488	536	600	690	825
4	550	600	664	750	870	1050
5	650	712	793	900	1050	1275
6	750	825	921	1050	1230	1500
7	850	938	1050	1200	1410	1725
8	881	973	1090	1246	1466	1795
9	912	1008	1130	1293	1522	1865
10	943	1043	1170	1340	1578	1935

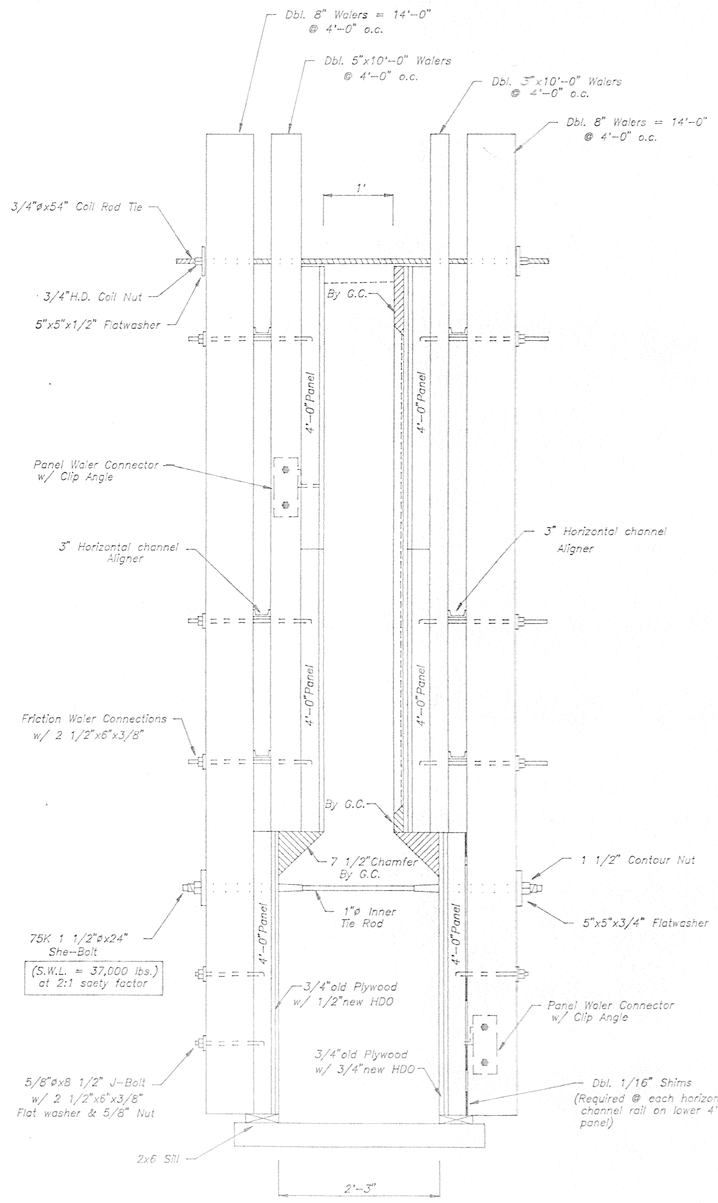
DESIGN PRESSURE = 1000 PSF
Based on ACI Committee 347 pressure formulas

1. Unless proposal states otherwise, Formwork Services and Supply Company does not furnish wood, wood fasteners, rails, rail accessories, anchor bolts, templet bolts, tie rods, tie rod accessories, loose washers for ties and anchors or any material left in the concrete.
2. In as much as Formwork Services and Supply Company does not control job-site assembly procedures or the grade and quality of materials supplied by others, it is the responsibility of the contractor to suitably integrate this set of drawings into an overall plan consistent with the contract documents, safe practice and project objectives.
3. It is the responsibility of the contractor to verify all dimensions prior to proceeding with concrete placement.
4. This set of drawings is provided as a service to illustrate the assembly of Formwork Services and Supply Company products only. It shall remain the property of Formwork Services and Supply Company and the information shown may not be used for other than its intended purpose. This set of drawings may not be reproduced without written permission of Formwork Services and Supply Company.
5. Formwork Services and Supply Company, representative should be consulted for approval where it is necessary to deviate from recommended procedures and/or layout drawings, or when necessary to make field modification to the equipment furnished.
6. Insure that all wall ties are in place and secure as per Formwork Services and Supply Company recommendations. Do not weld, bend, or otherwise alter wall ties.
7. Formwork should be adequately braced, reanchored, otherwise secured, and stabilized against wind and other external forces prior to releasing from lifting mechanism.
8. External vibrators will not be used unless they have been considered in design of the forms and so indicated on this set of drawings.
9. DO NOT SCALE DRAWINGS.
10. All bulkheads and job-built fillers are illustrations only, and the contractor is responsible for the fabrication, placement, and structural integrity of each item.

FWS
FORMWORK SERVICES AND SUPPLY COMPANY
14906 CHRISMAN • HOUSTON, TEXAS 77039 • (713) 590-1851
P.O. BOX 679 • HUMBLE, TEXAS 77347-0679

CUSTOMER	B & K CONSTRUCTION Co.		
JOB	FLOODWALL		
DESCRIPTION	VERSIFORM GANG FORMS		
DRAWN BY: BZ	CHECKED BY:	DATE 9-26-94	ORDER NO.
SCALE Noted	REVISION	DATE	DRAWING NO. 94069-1





MAXIMUM LATERAL PRESSURE FOR DESIGN OF WALL FORMS

Based on ACI Commitee 347 pressure formulas for placement at 10 ft per hour or less

NOTE: Do not use design pressures in excess of 150 X height of fresh concrete in forms.

Rate of placement, R, ft per hr	p,maximum lateral pressure, psf, for temperature indicated					
	90F	80F	70F	60F	50F	40F
1	250	262	278	300	330	375
2	350	375	407	450	510	600
3	450	488	536	600	690	825
4	550	600	664	750	870	1050
5	650	712	793	900	1050	1275
6	750	825	921	1050	1230	1500
7	850	938	1050	1200	1410	1725
8	881	973	1090	1246	1466	1795
9	912	1008	1130	1293	1522	1865
10	943	1043	1170	1340	1578	1935

DESIGN PRESSURE = 1000 PSF
Based on ACI Committee 347 pressure formulas

1. Unless proposal states otherwise, Formwork Services and Supply Company does not furnish wood, wood fasteners, rails, rail accessories, anchor bolts, templet bolts, tie rods, tie rod accessories, loose washers for the ties and anchors or any material left in the concrete.
2. In as much as Formwork Services and Supply Company does not control job-site assembly procedures or the grade and quality of materials supplied by others, it is the responsibillity of the contractor to suitably integrate this set of drawings into an overall plan consistent with the contract documents, safe practice and project objectives.
3. It is the responsibility of the contractor to verify all dimensions prior to proceeding with concrete placement.
4. This set of drawings is provided as a service to illustrate the assembly of Formwork Services and Supply Company products only. It shall remain the property of Formwork Services and Supply Company and the information shown may not be used for other than its intended purpose. This set of drawings may not be reproduced without written permission of Formwork Services and Supply Company.
5. Formwork Services and Supply Company, representative should be consulted for approval where it is necessary to deviate from recommended procedures and/or layout drawings, or when necessary to make field modification to the equipment furnished.
6. Insure that all wall ties are in place and secure as per Formwork Services and Supply Company recommendations. Do not weld, bend, or otherwise alter wall ties.
7. Formwork should be adequately braced, reanchored, otherwise secured, and stabilized against wind and other external forces prior to releasing from lifting mechanism.
8. External vibrators will not be used unless they have been considered in design of the forms and so indicated on this set of drawings.
9. DO NOT SCALE DRAWINGS.
10. All bulkheads and job-built fillers are illustrations only, and the contractor is responsible for the fabrication, placement, and structural integrity of each item.

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P.O. BOX 879 • HUMBLE, TEXAS 77347-0879

CUSTOMER	B & K CONSTRUCTION Co.		
JOB	FLOOD WALL		
DESCRIPTION	PRELIMINARY FORM DESIGN CONCEPTS		
DRAWN BY: BZ	CHECKEDBY:	DATE 9-14-94	ORDER NO.
SCALE 1"=1'	REVISION	DATE 9-20-94	DRAWING NO. 94089

ROUTING OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE FOR APPROVAL

(Used to route ENG Form 4025 with items attached. Not to become a part of the Contractor's record.)

	TO:	FROM:	DATE
1	C/Const Div	A/E, New Orleans	10/5/94

The attached items listed on ENG Form 4025 are forwarded for approval action.

CONTRACT NUMBER	CONTRACTOR
94-C-0079	B&K Const., Inc.
TRANSMITTAL NUMBERS Item # 75-78 Electrical Shop dwgs + data.	**PROJECT TITLE AND LOCATION** London Ave Canal Fldwl - Mirabeau & L.C.Smith

COMMENTS *(Attach additional sheet, if necessary.)*
Request your office review the attached electrical data & shop dwgs for subject contract. Furnish any comments to NOAD by COB 14 Oct 94

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
1	Dennis Dolan, Supv Civ Engr	for Chris Haynie

	TO:	FROM:	DATE
2	C/Engineering Div	C/Construction Div	10/6/94

COMMENTS *(Attach additional sheet, if necessary.)*
Request your office review attached submittal and provide comments to Const. Div by COB 13 Oct 94

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
1	RICHARD T. HILL	Richard T. Hill

	TO:	FROM:	DATE
3	C/Const Div	C/Engr Div	10/7/94

COMMENTS *(Attach additional sheet, if necessary.)*
Recommended for approval.
Please submit splice enclosure details

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
1	W. Eugene Tickner C/Engr Div	

	TO:	FROM:	DATE
4			

The following action codes are given to items listed on ENG Form 4025:

ACTION CODES

A - APPROVED AS SUBMITTED.

B - APPROVED, EXCEPT AS NOTED ON DRAWINGS. RESUBMISSION NOT REQUIRED.

C - APPROVED, EXCEPT AS NOTED ON DRAWINGS. REFER TO ATTACHED SHEET. RESUBMISSION REQUIRED.

D - WILL BE RETURNED BY SEPARATE CORRESPONDENCE.

E - DISAPPROVED (SEE ATTACHED)

F - RECEIPT ACKNOWLEDGED

G - OTHER *(specify)*

ACTION CODES TO BE INSERTED IN COLUMN G, SECTION I, ENG FORM 4025 *(Attach sheets, when required.)*

ITEM NO. (Taken from ENG Form 4025)								
CODE GIVEN								

REMARKS

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE

*U.S. G.P.O. 1985-521-246/393

Designation: A 193/A 193M – 93a

Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service[1]

This standard is issued under the fixed designation A 193/A 193M; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This specification has been approved for use by agencies of the Department of Defense. Consult the DoD Index of Specifications and Standards for the specific year of issue which has been adopted by the Department of Defense.

1. Scope

1.1 This specification[2] covers alloy and stainless steel bolting material for pressure vessels, valves, flanges, and fittings for high-temperature service. The term "bolting material" as used in this specification covers bars, bolts, screws, studs, stud bolts and wire. Bars and wire shall be hot-wrought. The material may be further processed by centerless grinding or by cold drawing. Austenitic stainless steel may be solution-annealed or annealed and strain-hardened.

1.2 Several grades are covered, including ferritic steels and austenitic stainless steels designated B5, B8, etc. Selection will depend upon design, service conditions, mechanical properties, and high-temperature characteristics.

NOTE 1—The committee formulating this specification has included fifteen steel types that have been rather extensively used for the present purpose. Other compositions will be considered for inclusion by the committee from time to time as the need becomes apparent.

NOTE 2—For grades of alloy-steel bolting material suitable for use at the lower range of high-temperature applications, reference should be made to Specification A 354.

NOTE 3—For grades of alloy-steel bolting material suitable for use in low-temperature applications, reference should be made to Specification A 320/A 320M.

1.3 Nuts for use with this bolting material are covered in Section 14.

1.4 Supplementary Requirements S1 through S8 are provided for use when additional tests or inspection are desired. These shall apply only when specified in the purchase order.

1.5 This specification is expressed in both inch-pound units and in SI units. However, unless the order specifies the applicable "M" specification designation (SI units), the material shall be furnished to inch-pound units.

1.6 The values stated in either inch-pound units or SI units are to be regarded separately as standard. Within the text, the SI units are shown in brackets. The values stated in each system are not exact equivalents; therefore, each system must be used independently of the other. Combining values from the two systems may result in nonconformance with the specification.

2. Referenced Documents

2.1 *ASTM Standards:*

A 29/A 29M Specification for General Requirements for Steel Bars, Carbon and Alloy, Hot-Wrought and Cold-Finished[3]

A 194/A 194M Specification for Carbon and Alloy Steel Nuts for Bolts for High-Pressure and High-Temperature Service[4]

A 320/A 320M Specification for Alloy Steel Bolting Materials for Low-Temperature Service[4]

A 354 Specification for Quenched and Tempered Alloy Steel Bolts, Studs, and Other Externally Threaded Fasteners[4,5]

A 370 Test Methods and Definitions for Mechanical Testing of Steel Products[4,6]

A 479/A 479M Specification for Stainless and Heat-Resisting Bars and Shapes for Use in Boilers and Other Pressure Vessels[3]

A 484/484 M Specification for General Requirements for Stainless and Heat-Resisting Bars, Billets, and Forgings[3]

A 788 Specification for Steel Forgings, General Requirements[3]

E 18 Test Methods for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials[7]

E 21 Practice for Elevated Temperature Tension Tests of Metallic Materials[7]

E 139 Practice for Conducting Creep, Creep-Rupture, and Stress-Rupture Tests of Metallic Materials[7]

E 150 Practice for Conducting Creep and Creep-Rupture Tension Tests of Metallic Materials Under Conditions of Rapid Heating and Short Times[8]

E 151 Practice for Tension Tests of Metallic Materials at Elevated Temperatures with Rapid Heating and Conventional or Rapid Strain Rates[8]

E 292 Practice for Conducting Time-for-Rupture Notch Tension Tests of Materials[7]

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[1] This specification is under the jurisdiction of ASTM Committee A-1 on Steel, Stainless Steel, and Related Alloys and is the direct responsibility of Subcommittee A01.22 on Valves, Fittings, Bolting, and Flanges for High and Subatmospheric Temperatures.

Current edition approved April 15, 1993. Published July 1993. Originally published as A 193 – 36 T. Last previous edition A 193/A 193M – 93.

[2] For ASME Boiler and Pressure Vessel Code applications see related Specification SA-193 in Section II of that Code.

[3] *Annual Book of ASTM Standards*, Vol 01.05.

[4] *Annual Book of ASTM Standards*, Vol 01.01.

[5] *Annual Book of ASTM Standards*, Vol 15.08.

[6] *Annual Book of ASTM Standards*, Vol 01.03.

[7] *Annual Book of ASTM Standards*, Vol 03.01.

[8] Discontinued, see *1983 Annual Book of ASTM Standards*, Vol 03.01.

E 328 Methods for Stress-Relaxation Tests for Materials and Structures[7]
E 381 Method of Macroetch Testing, Inspection, and Rating Steel Products, Comprising Bars, Billets, Blooms and Forgings[7]
E 566 Practice for Electromagnetic (Eddy-Current) Sorting of Ferrous Metals[9]
E 709 Guide for Magnetic Particle Examination[9]
F 606 Test Methods for Determining the Mechanical Properties of Externally and Internally Threaded Fasteners, Washers, and Rivets[10]
2.2 *ANSI Standards:*[11]
B1.1 Screw Threads
B18.2.1 Square and Hex Bolts and Screws
B18.3 Hexagon Socket and Spline Socket Screws

3. Ordering Information

3.1 The inquiry and order for material under this specification shall include the following as required to describe the material adequately:

3.1.1 Specification, designation, year date, and grade.

3.1.2 Heat-treated condition (that is, normalized and tempered, or quenched and tempered, for the ferritic materials, and solution treated (**Class 1**), solution treated after finishing (Class 1A), and annealed-and-strain-hardened (Class 2), for the austenitic stainless steels; Classes 1B and 1C apply to the solution-treated nitrogen-bearing stainless steels); Class ID applies to material solution treated by cooling rapidly from the rolling temperature,

3.1.3 Quantity (that is, number of pieces or weight),

3.1.4 Description of items required (that is, bars, bolts, screws, or studs),

3.1.5 Dimensions (that is, diameter, length of point, overall length, finish, shape, and threads),

3.1.6 Nuts, if required by purchaser, in accordance with 14.1,

3.1.7 Supplementary requirements, if any, and

3.1.8 Special requirements, in accordance with 6.3, 6.6, 13.3, 15.1, 16.1, 17.1, and 18.1.

4. Manufacture (Process)

4.1 The steel shall be produced by any of the following processes: open-hearth, basic-oxygen, electric-furnace or vacuum-induction melting (VIM). The primary melting method may incorporate separate degassing or refining. The molten steel may be vacuum-treated prior to or during pouring of the ingot or strand casting. The basic-oxygen process shall be limited to steels containing not over 6 % chromium.

4.2 *Quality*—The producer quality control procedures shall provide sufficient testing of Carbon and Alloy Steels in accordance with Method E 381 as stipulated in Sections 5, 7, and 8 or other suitable method as agreed upon between the purchaser and the producer to assure the internal quality of the product. A bar lot consisting of one heat or 10 000 lbs whichever is smaller, shall be represented by a minimum of one macroetch. Visual examination of transverse sections shall show no imperfections worse than the macrographs of Method E 381 S4-R4-C4 or equivalent as agreed upon. Distinct zones of solidification shall not be present.

5. Discard

5.1 A sufficient discard shall be made to secure freedom from injurious piping and undue segregation.

6. Heat Treatment

6.1 Ferritic steels shall be properly heat treated as best suits the high-temperature characteristics of each grade. Immediately after rolling or forging, the bolting material shall be allowed to cool to a temperature below the cooling transformation range. The materials which are to be furnished in the liquid-quenched condition shall then be uniformly reheated to the proper temperature to refine the grain (a group thus reheated being known as a "quenching charge") and quenched in a liquid medium under substantially uniform conditions for each quenching charge. The materials that are to be furnished in the normalized or air-quenched condition shall be reheated to the proper temperature to refine the grain and cooled uniformly in air to a temperature below the transformation temperature range. The material, whether liquid-quenched or normalized, shall then be uniformly reheated for tempering. The minimum tempering temperature shall be as specified in Table 2.

6.1.1 Quenched and tempered or normalized and tempered ferritic material that is subsequently cold drawn for dimensional control shall be stress-relieved after cold drawing. The minimum stress-relief temperature shall be 100°F [55°C] below the tempering temperature. Tests for mechanical properties shall be performed after stress relieving.

6.2 Both B6 and B6X materials shall be held, at the tempering temperature for a minimum time of 1 h. Identification Symbol B6X material may be furnished in the as-rolled-and-tempered condition. Cold working is permitted with the hardness limitation (26 HRC maximum) of Table 2 for the B6X grade.

6.3 Austenitic stainless steels shall receive a carbide solution treatment. After rolling, forging or heading, whether done hot or cold, the material shall be heated from ambient temperature and held a sufficient time at a temperature at which the chromium carbide will go into solution and then shall be cooled at a rate sufficient to prevent the precipitation of the carbide. Material thus treated is described as **Class 1**, Class 1B, or Class 1C. Alternatively, rolled or forged bar (except for grades 321 and 347) may be cooled rapidly immediately following hot working while the temperature is above 1750°F (955°C), so that grain boundary carbides are in solution, (see Specification A 479 – 88b and subsequent revisions). Material so treated is identified as Class 1D and shall be restricted to applications at temperatures less than 850°F (455°C). If specified in the purchase order, material shall be solution treated in the finished condition; material so treated is described as Class 1A.

6.4 If scale-free bright finish is required, this shall be specified in the purchase order.

[9] *Annual Book of ASTM Standards*, Vol 03.03.
[10] *Annual Book of ASTM Standards*, Vol 15.08.
[11] Available from American National Standards Institute, 11 West 42nd St., 13th Floor, New York, NY 10036.

TABLE 1 Chemical Requirements (Composition, percent)[A]

Type	Ferritic Steels			
Identification Symbol	B5		B6 and B6X	
Grade	5 % Chromium (AISI Type 501)		12 % Chromium (AISI Type 410)	
			AISI Type 410	
	Range	Product Variation, Over or Under[B]	Range	Product Variation, Over or Under[B]
Carbon	0.10 min	0.01 under	0.15 max	0.01 over
Manganese, max	1.00	0.03 over	1.00	0.03 over
Phosphorus, max	0.040	0.005 over	0.040	0.005 over
Sulfur, max	0.030	0.005 over	0.03	0.005 over
Silicon	1.00 max	0.05 over	1.00 max	0.05 over
Chromium	4.00–6.00	0.40	11.50–13.50	0.15
Molybdenum	0.40–0.65	0.05	...	...

Type	Ferritic Steels		
Identification Symbol	B7, B7M		B16
Grade	Chromium-Molybdenum (AISI 4140, 4142, 4145, 4140 or 4142 H, and 4145 H)		Chromium-Molybdenum-Vanadium
	Range	Product Variation, Over or Under[B]	Range	Product Variation, Over or Under[B]
Carbon	0.37–0.49[C]	0.02	0.36–0.47	0.02
Manganese	0.65–1.10	0.04	0.45–0.70	0.03
Phosphorus, max	0.035	0.005 over	0.035	0.005 over
Sulfur, max	0.040	0.005 over	0.040	0.005 over
Silicon	0.15–0.35	0.02	0.15–0.35	0.02
Chromium	0.75–1.20	0.05	0.80–1.15	0.05
Molybdenum	0.15–0.25	0.02	0.50–0.65	0.03
Vanadium	...	...	0.25–0.35	0.03

Type	Austenitic Steels,[D] Classes 1, 1A, 1D, and 2							
Identification Symbol	B8, B8A		B8C, B8CA		B8M, B8MA B8M2, B8M3		B8P, B8PA	
Grade	Unstabilized 18 Chromium-8 Nickel (AISI Type 304)		Stabilized 18 Chromium-8 Nickel (AISI Type 347)		18 Chromium-10 Nickel-2 Molybdenum (AISI Type 316)		Unstabilized 18 Chromium-8 Nickel (AISI Type 305 with restricted carbon)	
	Range	Product Variation, Over or Under[B]	Range	Product Variation, Over or Under[B]	Range	Product Variation, Over or Under[B]	Range	Product Variation, Over or Under[B]
Carbon, max	0.08	0.01 over	0.08	0.01 over	0.08	0.01 over	0.08	0.01 over
Manganese, max	2.00	0.04 over	2.00	0.04 over	2.00	0.04 over	2.00	0.04 over
Phosphorus, max	0.045	0.010 over	0.045	0.010 over	0.045	0.010 over	0.045	0.010 over
Sulfur, max	0.030	0.005 over	0.030	0.005 over	0.030	0.005 over	0.030	0.005 over
Silicon, max	1.00	0.05 over	1.00	0.05 over	1.00	0.05 over	1.00	0.05 over
Chromium	18.00–20.00	0.20	17.00–19.00	0.20	16.00–18.00	0.20	17.00–19.00	0.20
Nickel	8.00–10.50	0.15	9.00–13.00	0.15	10.00–14.00	0.15	10.50–13.00	0.15
Molybdenum	...	...	...	...	2.00–3.00	0.10	...	...
Columbium + tantalum	...	...	10 × carbon content, min	0.05 under	...	...	...	...

Type	Austenitic Steels,[D] Classes 1A, 1B, 1D, and 2				
Identification Symbol	B8N, B8NA		B8MN, B8MNA		B8MLCuN, B8MLCuNA
Grade	(AISI Type 304N)		(AISI Type 316N)		Unstabilized, 20 Chromium, 18 Nickel, 6 Molybdenum with restricted carbon
	Range	Product Variation, Over or Under[B]	Range	Product Variation, Over or Under[B]	Range
Carbon, max	0.08	0.01 over	0.08	0.01 over	0.020
Manganese, max	2.00	0.04 over	2.00	0.04 over	1.00
Phosphorus, max	0.045	0.010 over	0.045	0.010 over	0.030
Sulfur, max	0.030	0.005 over	0.030	0.005 over	0.010
Silicon, max	1.00	0.05 over	1.00	0.05 over	0.80
Chromium	18.00–20.00	0.20	16.00–18.00	0.20	19.50–20.50
Nickel	8.00–10.50	0.15	10.00–14.00	0.15	17.50–18.50
Molybdenum	...	...	2.00–3.00	0.10	6.00–6.50
Nitrogen	0.10–0.16	0.01	0.10–0.16	0.01	0.18–0.22
Copper	...	...	...	...	0.50–1.00

(Continued)

TABLE 2 Mechanical Requirements

Grade	Diameter, in. [mm]	Minimum Tempering Temperature, °F [°C]	Tensile Strength, min, ksi [MPa]	Yield Strength, min, 0.2 % offset, ksi [MPa]	Elongation in 4 D, min, %	Reduction of Area, min, %	Hardness, max
		Ferritic Steels					
B5							
4 to 6 % chromium	up to 4 [100], incl	1100 [593]	100 [690]	80 [550]	16	50	...
B6							
13 % chromium	up to 4 [100], incl	1100 [593]	110 [760]	85 [585]	15	50	...
B6X							
13 % chromium	up to 4 [100], incl	1100 [593]	90 [620]	70 [485]	16	50	26 HRC
B7							
Chromium-molybdenum	2½ [65] and under	1100 [593]	125 [860]	105 [720]	16	50	...
	over 2½ to 4 [65 to 100]	1100 [593]	115 [795]	95 [655]	16	50	...
	over 4 to 7 [100 to 180]	1100 [593]	100 [690]	75 [515]	18	50	...
B7M[A]							
Chromium-molybdenum	2½ [65] and under	1150 [620]	100 [690]	80 [550]	18	50	235 HB or 99 HRB
	4 [101.6] and under	1150 [620]	100 [690]	80 [550]	18	50	235 BHN or 99 R/B
	over 4 to 7 [101.6 to 117.8]	1150 [620]	100 [690]	75 [515]	18	50	235 BHN or 99 R/B
B16							
Chromium-molybdenum-vanadium	2½ [65] and under	1200 [650]	125 [860]	105 [725]	18	50	...
	over 2½ to 4 [65 to 100]	1200 [650]	110 [760]	95 [655]	17	45	...
	over 4 to 7 [100 to 180]	1200 [650]	100 [690]	85 [585]	16	45	...

Class and Grade, Diameter, in. [mm]	Heat Treatment[B]	Tensile Strength, min, ksi [MPa]	Yield Strength, min, 0.2 % offset, ksi [MPa]	Elongation in 4 D, min, %	Reduction of Area, min %	Hardness, max
	Austenitic Steels					
Classes 1 and 1D: B8, B8C, B8M, B8P, B8T, B8LN, B8MLN, all diameters	carbide solution treated	75 [515]	30 [205]	30	50	223 HB[C] or 96 HRB
Class 1A: B8A, B8CA, B8MA, B8PA, B8TA, B8LNA, B8MLNA, B8NA, B8MNA, B8MLCuNA all diameters	carbide solution treated in the finished condition	75 [515]	30 [205]	30	50	192 HB or 90 HRB
Classes 1B and 1D: B8N, B8MN, and B8MLCuN all diameters	carbide solution treated	80 [550]	35 [240]	30	40	223 HB[C] or 96 HRB
Classes 1C and 1D: B8R, all diameters	carbide solution treated	100 [690]	55 [380]	35	55	271 HB or 28 HRC
B8RA, all diameters	carbide solution treated in the finished condition	100 [690]	55 [380]	35	55	271 HB or 28 HRC
B8S, all diameters	carbide solution treated	95 [655]	50 [345]	35	55	271 HB or 28 HRC
B8SA, all diameters	carbide solution treated in the finished condition	95 [655]	50 [345]	35	55	271 HB or 28 HRC
Class 2: B8, B8C, B8P, B8T, B8N, and B8MLCuN, ¾ [20] and under	carbide solution treated and strain hardened	125 [860]	100 [690]	12	35	321 HB or 35 HRC
over ¾ to 1, [20 to 25] incl		115 [795]	80 [550]	15	35	321 HB or 35 HRC
over 1 to 1¼ [25.4 to 31.6] incl		105 [725]	65 [450]	20	35	321 HB or 35 HRC
over 1¼ to 1½ [32 to 40] incl		100 [690]	50 [345]	28	45	321 HB or 35 HRC
Class 2: B8M, B8MN, B8MLCuN[D] ¾ [19.05] and under	carbide solution treated and strain hardened	110 [760]	95 [665]	15	45	321 HB or 35 HRC
over ¾ to 1 [19.05 to 25.4] incl		100 [690]	80 [550]	20	45	321 HB or 35 HRC
over 1 to 1¼ [25.4 to 31.6] incl		95 [655]	65 [450]	25	45	321 HB or 35 HRC
over 1¼ to 1½ [31.6 to 37.9] incl		90 [620]	50 [345]	30	45	321 HB or 35 HRC

(Continued)

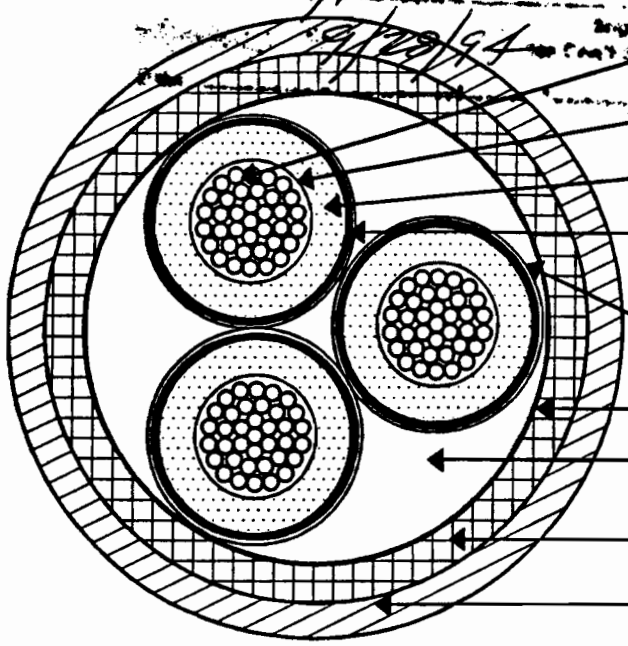
APPROX

☐ APP. AS NOTED ☐ REJECTED

The approval of this drawing is limited only to general compliance with contract requirements and design but not to dimensions, quantities or details of construction.

It shall not relieve the contractor of the responsibility for errors, discrepancies, omissions or other requirements of his contract obligation.

Approved by Clayton T. Perret 9/20/94



500 kcmil (37x) BARE CLASS B STRANDED COPPER CONDUCTOR NOMIAL OD = 0.793" Ⓐ

EXTRUDED SEMICONDUCTING STRAND SCREEN (EPR) 0.020" Ⓑ

INSULATION - .220" OKOGUARD® (EPR) NOM. OD=1.294"

0.032" EXTRUDED SEMICONDUCTING INSULATION SCREEN (EPR) NOM. OD=1.372" Ⓐ

0.005" BARE COPPER TAPE SHIELD, 12½% LAP Ⓐ

BINDER TAPE (NEOPRENE/NYLON) Ⓐ

POLYPROPYLENE FILLERS

0.110" COPPER BEARING LEAD SHEATH NOM. OD= 3.228" Ⓐ

0.095" JACKET-OKOSEAL® (PVC) NOM. OD= 3.432"

NOMINAL CABLE WEIGHT = 13298 LBS/1000FT Ⓐ

COLOR CODE = BLACK / WHITE / BLUE LONGITUDINAL MYLAR TAPES Ⓐ UNDER COPPER TAPE SHIELD

CABLE PRINT LEGEND:

OKONITE _ 3/C 500 KCMIL CU OKOGUARD (EP) - PVC 15KV SHLD 133% INSUL LEVEL 220 MILS {LIGHTNING BOLT POWER CABLE ID}

NEW ORLEANS SEWER AND WATER BOARD Ⓐ
OKONITE REFERENCE No. O-129

THIS DRAWING IS CERTIFIED TO BE CORRECT James V Fitzgerald

3/C 500 KCMIL OKOGUARD SHLD LEAD SHEATH OKOSEAL(PVC) 15KV 133% INSUL LEV POWER CABLE

THE OKONITE COMPANY RAMSEY, NJ USA	DATE: 11-16-93 SCALE: NTS DR. JAC TR. CH. APP. JVF	REVISIONS Ⓑ 1-5-94 DRAWING NUMBER CS-7070

STRAIGHT SPLICE KIT (2 WAY)

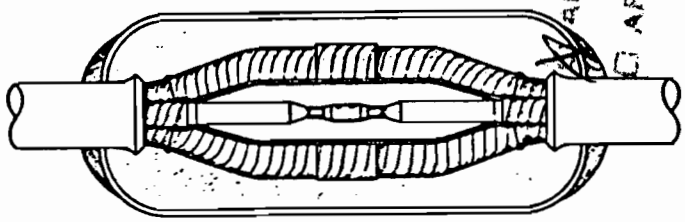
*Polymeric Insulated Lead Sheath Cable

Three Conductor

FOR A RELIABLE MEANS OF TERMINATING THIS TYPE CABLE, REFER TO THE MAC POTHEAD CATALOG OR CONSULT FACTORY

TYPE RLS3

A complete unit splice kit for making a straight, 2 way splice of a three conductor rubber, cross-linked polyethylene or other *polymeric cable with a lead sheath, the MAC RLS 3 is complete with step by step installation instructions and all the proper grade materials necessary for making the splice.

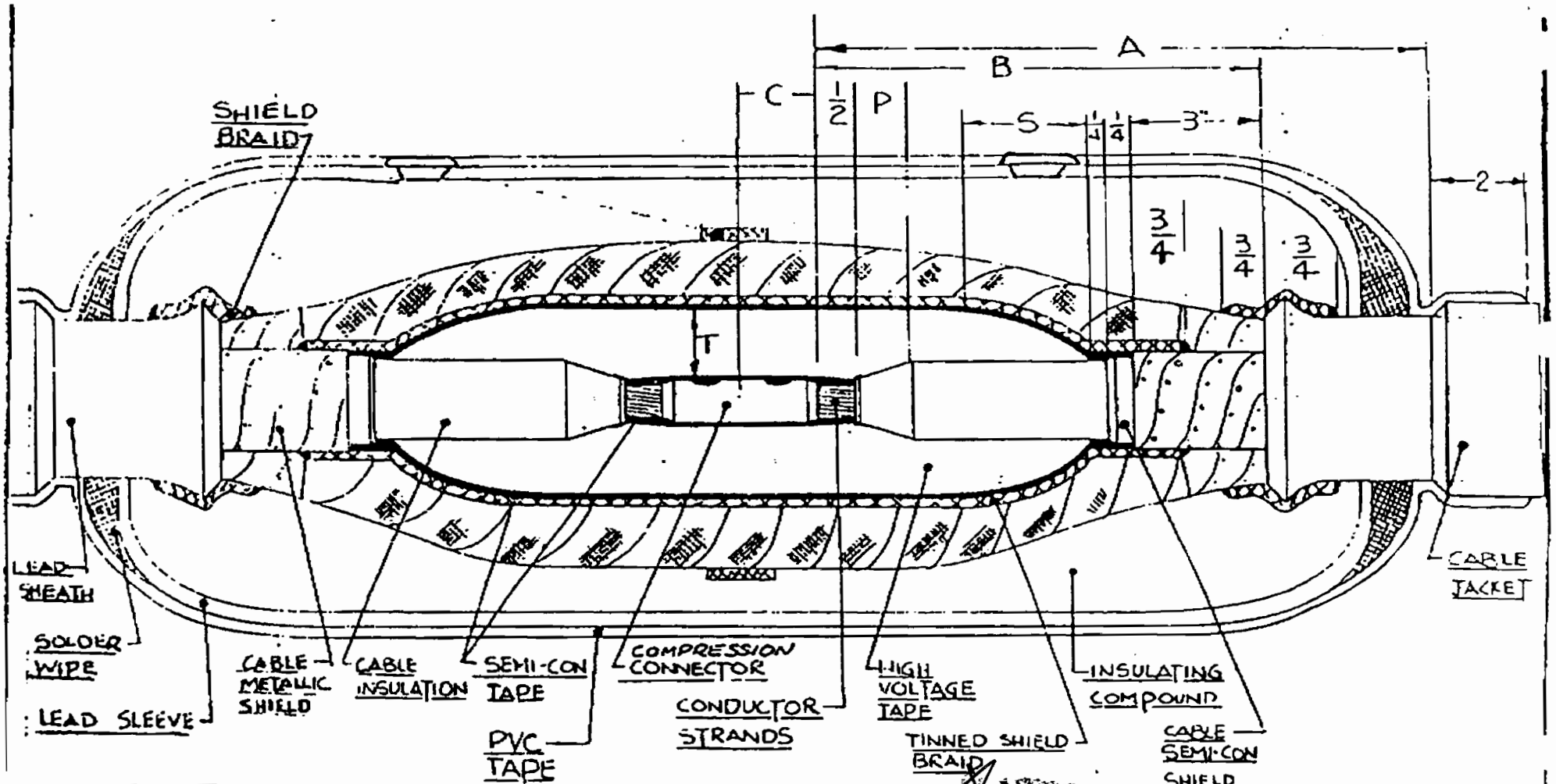


CABLE SIZE	5 KV 7.5 KV GRD. CATALOG NUMBER	7.5 KV UNGRD. 15 KV GRD. CATALOG NUMBER	15 KV UNGRD. CATALOG NUMBER	27 KV GRD. CATALOG NUMBER	35 KV GRD. CATALOG NUMBER
8	RLS3-108	RLS3-208	RLS3-308	---	----
6	RLS3-106	RLS3-206	RLS3-306	---	----
4	RLS3-104	RLS3-204	RLS3-304	----	----
2	RLS3-102	RLS3-202	RLS3-302	RLS3-402	----
1	RLS3-101	RLS3-201	RLS3-301	RLS3-401	RLS3-501
1/0	RLS3-110	RLS3-210	RLS3-310	RLS3-410	RLS3-510
2/0	RLS3-120	RLS3-220	RLS3-320	RLS3-420	RLS3-520
3/0	RLS3-130	RLS3-230	RLS3-330	RLS3-430	RLS3-530
4/0	RLS3-140	RLS3-240	RLS3-340	RLS3-440	RLS3-540
250	RLS3-1250	RLS3-2250	RLS3-3250	RLS3-4250	RLS3-5250
300	RLS3-1300	RLS3-2300	RLS3-3300	RLS3-4300	RLS3-5300
350	RLS3-1350	RLS3-2350	RLS3-3350	RLS3-4350	RLS3-5350
400	RLS3-1400	RLS3-2400	RLS3-3400	RLS3-4400	RLS3-5400
500	RLS3-1500	RLS3-2500	[illegible]	RLS3-4500	RLS3-5500
600	RLS3-1600	RLS3-2600	RLS3-3600	RLS3-4600	RLS3-5600
750	RLS3-1750	RLS3-2750	RLS3-3750	RLS3-4750	RLS3-5750
1000	RLS3-11000	RLS3-21000	RLS3-31000	RLS3-41000	RLS3-51000

NOTE: All catalog numbers on this page refer to copper conductors only. Add suffix—AC if ordering or specifying aluminum.

*Polymeric is a term used to describe the following insulations: Oil Base Rubber, Butyl Rubber, PVC, Low and High Density Polyethylene, Ethylene Propylene Rubber, and Cross Linked Polyethylene

MAC PRODUCTS, INC. KEARNY, NEW JERSEY 07032



VOLTAGE	A	B	C	S	P	T
15kV. ungr.	15"	$9\frac{1}{4}$"	$1\frac{1}{8}$"	$3\frac{1}{4}$"	2"	$\frac{3}{8}$"

☒ APPROVED ☐ Service is Restricted

☐ APP. AS NOTED ☐ REJECTED

The approval of this drawing is limited only to general compliance with contract requirements and design but not as dimensions, quantities or details of construction.

It shall not relieve the contractor of his responsibility for errors, discrepancies, omissions or other requirements of his contract obligations.

Approved: Clayton D. Perret Engineer

Date: 9/28/94 for Public Body

1) STRAIGHT SPLICE 3/C POLYMERIC INSULATED, LEAD COVERED, SHIELDED

NOTE: SIZE CRIMP SLEEVE FOR 400 MCM X 500 MCM.

Rigid Steel Conduit

MFG. BY WHEATLAND or TRIANGLE

SIZED AS NEEDED

Ten-Foot Lengths with One Coupling

Available in hot dipped galvanized or electro-galvanized. Furnished in 10-foot lengths with both ends threaded, with coupling screwed on one end.

Size In.	Wt. Lbs. Per 100 Ft.	Outside Diameter Inches	Wall Thickness Inches
½	79	.840	.109
¾	105	1.050	.113
1	153	1.315	.133
1¼	201	1.660	.140
1½	249	1.900	.145
2	334	2.375	.154
2½	527	2.875	.203
3	690	3.500	.216
3½	831	4.000	.226
4	982	4.500	.237
5	1334	5.563	.258
6	1770	6.625	.280

☒ APPROVED ☐ Revise & Resubmit

☐ APP. AS NOTED ☐ REJECTED

The approval of the drawing is limited only to general compliance with contract requirements and design but not to dimensions, quantities or details of construction.

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Approved by _____ Signature

9/28/94

CONDUIT FITTINGS (continued)

Pipe Straps

- *Steel.*
- *Designed to fit conduit snugly.*
- *High reinforcing ribs increase strength, reduce weight.*

Catalog Number	Size	Bolt Size	Unit Qty.	Std. Pkg.	Wt. per 100	Trade Cost Per 100 Less Than Unit Pkg.	Unit Pkg.	Std. Pkg.	NAED Number
1210	3/8"	1/4"	100	500	6	$ 36.24	$ 28.31	$ 22.65	786210-01210
1211	1/2"	1/4"	100	500	10	27.05	21.13	16.91	786210-01211
1212	3/4"	1/4"	50	500	13	33.07	25.83	20.67	786210-01212
1213	1"	1/4"	50	100	21	65.55	51.21	40.97	786210-01213
1214	1 1/4"	5/16"	25	100	30	83.79	65.46	52.37	786210-01214
1215	1 1/2"	3/8"	10	50	38	106.60	83.28	66.63	786210-01215
1216	2"	3/8"	5	25	48	190.43	148.77	119.02	786210-01216

LR 2684

UL not applicable.

Pipe Straps

- *Malleable Iron.*

Catalog Number	Size	Bolt Size	Unit Qty.	Std. Pkg.	Wt. per 100	Trade Cost Per 100 Less Than Unit Pkg.	Unit Pkg.	Std. Pkg.	NAED Number
1275	3/8"	1/4"	100	500	5	$ 46.11	$ 36.02	$ 28.82	786210-01275
1276	1/2"	1/4"	100	500	5	41.42	32.36	25.89	786210-01276
1277	3/4"	1/4"	100	500	6	59.12	46.18	36.95	786210-01277
1278	1"	1/4"	50	100	9	83.85	65.51	52.41	786210-01278
1279	1 1/4"	3/8"	25	100	16	156.32	122.12	97.70	786210-01279
1280	1 1/2"	3/8"	25	50	22	183.26	143.17	114.54	786210-01280
1281	2"	1/2"	5	25	41	358.08	279.75	223.80	786210-01281
1282	2 1/2"	1/2"	5	25	71	732.84	572.53	458.03	786210-01282
1283	3"	1/2"	5	10	100	969.24	757.22	605.78	786210-01283
1284	3 1/2"	5/8"	1	5	140	1499.40	1171.41	937.13	786210-01284
1285	4"	5/8"	1	5	155	3328.32	2600.25	2080.20	786210-01285
1286	4 1/2"	5/8"	1	5	205	6606.17	5161.07	4128.86	786210-01286
1287	5"	5/8"	1	5	245	–	9153.33	7322.66	786210-01287
1288	6"	5/8"	–	1	395	–	–	7858.49	786210-01288

LR 2684

UL not applicable.

☒ APPROVED ☐ Revise & Resubmit
☐ APP. AS NOTED ☐ REJECTED

The approval of this drawing is limited only to general compliance with contract requirements and design but not to dimensions, quantities or details of construction.
It shall not relieve the contractor of the responsibility for errors. Discrepancies, omissions or other requirements of the contract obligations.

Approved by Clayton H. Pruett
Engineer for Gen'l Supt.
Date 9/28/94

CONDUIT FITTINGS (continued)

Corrosion Resistant PVC Coated Rigid Conduit Straps

- *Malleable iron.*

Catalog Number	Size	Bolt Size	Unit Qty.	Std. Pkg.	Wt. per 100	Trade Cost Per 100 Less Than Unit Pkg.	Unit Pkg.	Std. Pkg.	NAED Number
1275CR	⅜"	¼"	100	500	5	$ 270.64	$ 211.43	$ 169.15	786210-82646
1276CR	½"	¼"	100	500	5	255.55	199.65	159.72	786210-82647
1277CR	¾"	¼"	50	500	6	309.31	241.65	193.32	786210-82649
1278CR	1"	¼"	50	100	9	487.40	380.78	304.63	786210-82662
1279CR	1¼"	⅜"	25	100	16	811.90	478.05	382.44	786210-82668
1280CR	1½"	⅜"	25	50	22	806.86	630.36	504.29	786210-82670
1281CR	2"	½"	5	25	41	1171.58	915.30	732.24	786210-82679

SD LR 2884

UL not applicable.

Entrance Ells*

- *Aluminum.*

Thomas & Betts entrance ells mount flat against wall eliminating need for offsetting the conduit. Designed for a straight pull in either direction and carefully bushed, these entrance ells make it easy to pull heavy wires without damage to insulation.

Catalog Number	Size	Unit Qty.	Std. Pkg.	Wt. per 100	Trade Cost Per 100 Less Than Unit Pkg.	Unit Pkg.	Std. Pkg.	NAED Number
1490	½"	10	50	25	$ 497.06	$ 388.35	$ 310.68	786210-01490
1491	¾"	10	50	32	618.46	481.61	385.29	786210-01491
1492	1"	5	25	50	1002.48	783.18	626.55	786210-01492
1493	1¼"	2	10	80	1378.20	1076.72	861.38	786210-01493
1494	1½"	2	10	116	3168.40	2475.36	1980.29	786210-01494
1495	2"	1	5	190		3760.36	3008.30	786210-01495

UL E 23018 SD LR 2284 & LR 589

* Suitable for use in hazardous location where general purpose equipment is specifically permitted by the NEC; Class I Div. 2; Class II, Div. 1 & 2; Class III, Div. 1 & 2, NEC 501-4(b); 502-4(s) (b); 503-3(a) (b).

Pipe Spacers

- *Malleable iron.*
- *Pre-mountable.*
- *Stackable to eliminate offsetting.*

X APPROVED ☐ APP. AS NOTED ☐ REJECTED

The approval of this drawing is limited only to general ... design but not to ... it shall not relieve the contractor of his responsibility for ... conformity of the ... with the contract documents.

Catalog Number	Size	Unit Qty.	Std. Pkg.	Wt. per 100	Trade Cost Per 100 Less Than Unit Pkg.	Unit Pkg.	Std. Pkg.	NAED Number
1350	½"-¾"-1"	50	100	10	$ 108.68	$ 84.91	$ 67.93	786210-01350
1351	1¼"-1½"-2"	25	50	25	297.56	232.47	185.98	786210-01351
1352	2½"-3"	10	20	56	888.12	650.49	786210-01352
1353	3½"-4"	1	5	77	2639.05	2061.76	1649.41	786210-01353
1354	4½"-5"-6"	1	4	138	13010.56	10166.50	8130.80	786210-01354

SD LR 2884

UL not applicable.

9/29/94

ROUTING OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE FOR APPROVAL

(Used to route ENG Form 4025 with items attached. Not to become a part of the Contractor's record.)

	TO:	FROM:	DATE
1	C/Const Div	A/E, New Orleans	10/27/94

The attached items listed on ENG Form 4025 are forwarded for approval action.

CONTRACT NUMBER	CONTRACTOR
94-C-0079	

TRANSMITTAL NUMBERS	PROJECT TITLE AND LOCATION
Item #17: Resubmittal of sheet pile shop dwgs	London Ave Floodwall - Mirabeau to L.C. Smith

COMMENTS (Attach additional sheet, if necessary)

Request your office review the resubmitted alternate sheet pile shop drawings + layout for subject contract. Furnish any comments to NOAO by COB 9 Nov 94.

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
1	Dennis Dubon, Supv CN Engr	

	TO:	FROM:	DATE
2	C/Engr. Div	C/Const Div	10/31/94

COMMENTS (Attach additional sheet, if necessary)

Forwarded for review & cmt by COB 8 Nov 94

POC is Jim Berry X1240

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
	RICHARD T. HILL	Richard T. Hill

	TO:	FROM:	DATE
3	C/Const Div	C/Eng Div	11/3/94

COMMENTS (Attach additional sheet, if necessary)

Recommended for approval subject to incorporation of comments annotated in red on the shop dwgs.

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
1	W. Eugene Tickner C/Eng Div	

	TO:	FROM:	DATE
4			

The following action codes are given to items listed on ENG Form 4025:

ACTION CODES

A - APPROVED AS SUBMITTED.

B - APPROVED, EXCEPT AS NOTED ON DRAWINGS. RESUBMISSION NOT REQUIRED.

C - APPROVED, EXCEPT AS NOTED ON DRAWINGS. REFER TO ATTACHED SHEET. RESUBMISSION REQUIRED.

D - WILL BE RETURNED BY SEPARATE CORRESPONDENCE.

E - DISAPPROVED (SEE ATTACHED)

F - RECEIPT ACKNOWLEDGED

G - OTHER (specify)

ACTION CODES TO BE INSERTED IN COLUMN G, SECTION I, ENG FORM 4025 (Attach)

ITEM NO. (Taken from ENG Form 4025)						
CODE GIVEN						

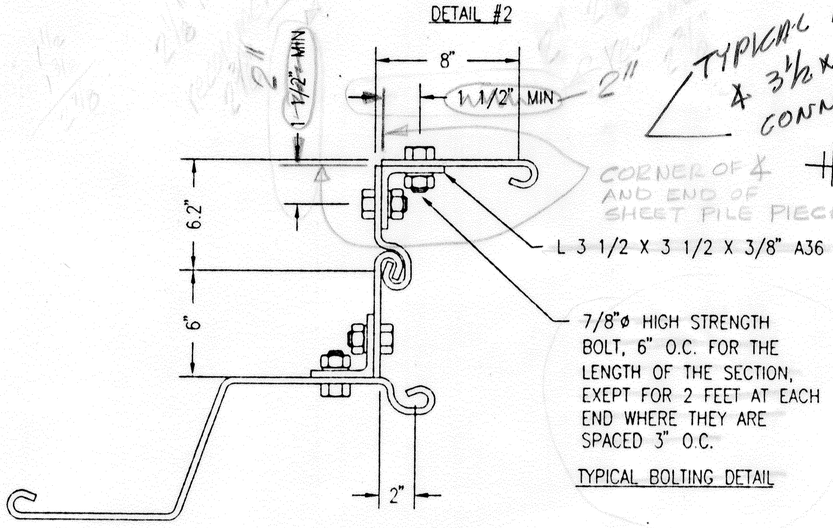
REMARKS

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE

ENG FORM 1 NOV 74 4026 EDITION OF NOV 66 MAY BE USED.

OCT 28 1994

DETAIL #2



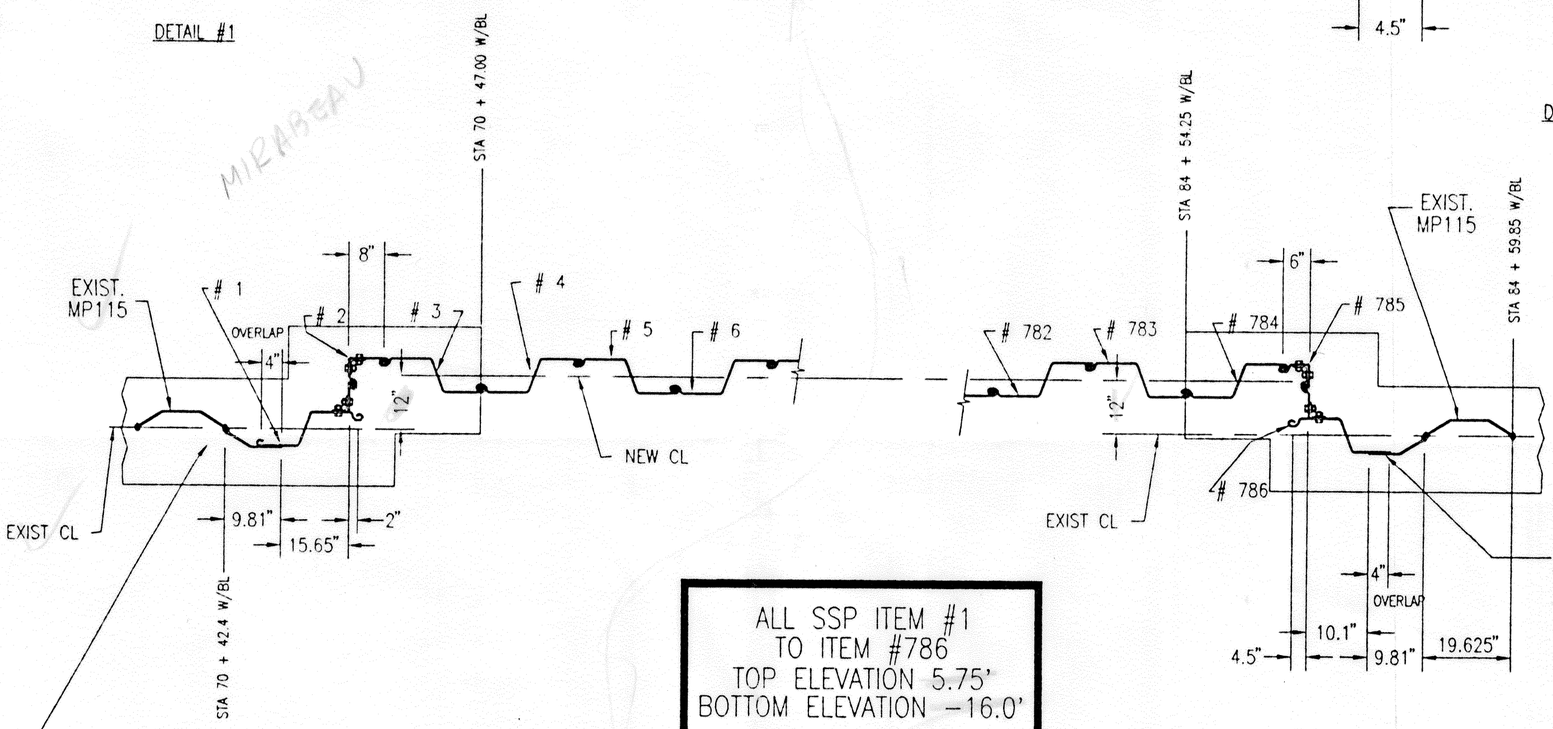
TYPICAL BOLTING DETAIL

TYPICAL AT ALL 4 3½ x 3½ x 3/8 CONNECTIONS

CORNER OF 4 AND END OF SHEET PILE PIECE

N

DETAIL #1

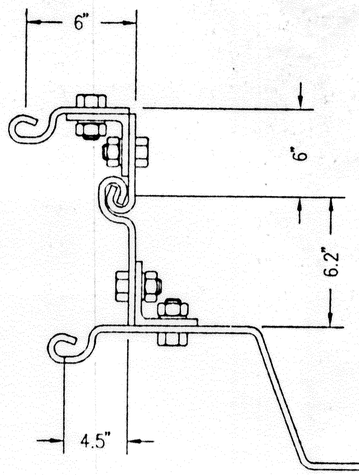


FIELD WORK: ADJUST DIMENSIONS IF REQ.
FABRICATE TRANSITION PIECE BY BOLTING
1/2 MP 115 WITH PC # 1

ALL SSP ITEM #1
TO ITEM #786
TOP ELEVATION 5.75'
BOTTOM ELEVATION -16.0'

FIELD WORK: ADJUST DIMENSIONS IF REQ.
FABRICATE TRANSITION PIECE BY CUTTING
PC # 786 & BOLTING WITH 1/2 MP 115

DETAIL #785



DETAIL #786

LIST OF MATERIAL

- ALL STEEL SHEET PILING SHALL BE AS MANUFACTURED BY THE CASTEEL GROUP INC.
- STEEL QUALITY : TO MEET ASTM A572 GR.50
- THIS PROPOSAL & LAYOUT IS SUBJECT TO CUSTOMER REVIEW & ACCEPTANCE.
- ALL CORNERS AND ALL TRANSITION PIECES SHALL BE BOLTED AS PER DETAILS SHOWN ON DRAWING USING 7/8" BOLTS -ASTM A325 TYPE 1.

PIECES No:	TYPE	QTY	LENGTH (FT)*	AREA (ft2)	NOTE
1 & 786	CZ101-90° TEES	2	21.75	117.72	REQ. 3 PCS TO FAB.
2 & 785	CZ101 FABR. 90° CORNER	2	21.75	78.48	
4 TO 784	CZ101	782	21.75	30686.17	
TOTAL PCS CZ101 REQ.		787			
			TOTAL AREA (ft2) : 30882.37		
TOTAL PCS SHIPPED.		786	TOTAL WEIGHT : 319.84 TONS		

* IF ADD. CUT OFF IS REQ'D, CONTRACTOR MAY ORDER LONGER LENGTHS THAN INDICATED.

GENERAL NOTES.

THEORITICAL WALL LENGTHS AND SOME STATIONS HAVE BEEN SLIGHTLY MODIFIED TO ACCOMODATE CASTEEL'S SECTIONS WIDTH. THESE VARIATIONS ON THE SHOP DRAWINGS ARE NOT SIGNIFICANT AND GENERALLY LESS THAN ONE FOOT.
USUAL DRIVING TOLERANCES FOR INTERLOCKED S.S.P. IS ±3% OF THEORITICAL WIDTH.
THEREFORE SOME FIELD ADJUSTMENTS ARE POSSIBLE AND MAY BE REQUIRED IF EXACT STATIONS LOCATIONS ARE TO BE MEET AT THE END OF A GIVEN WALL.

NOTE: FOR OTHERS DIM'S
SEE OPOSITE SIDE

THIRD ANGLE PROJECTION

	REVISION	DATE		REVISION	DATE
1		OCT/17/94	4		
2			5		
3			6		

NOTICE
CONFIDENTIAL PROPERTY OF THE CASTEEL GROUP INC.

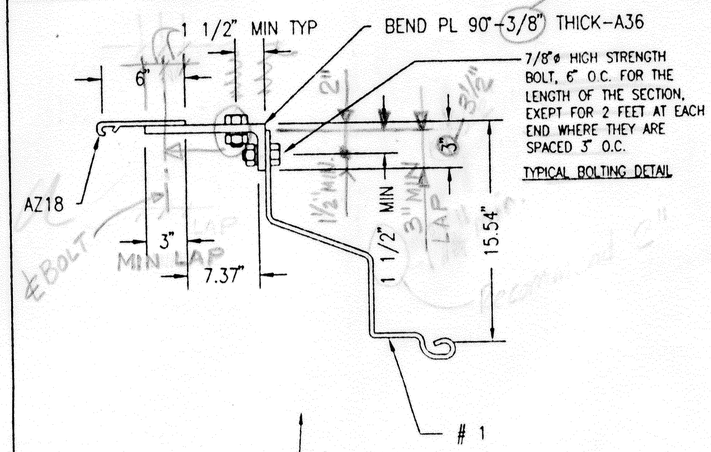
THE CASTEEL GROUP inc

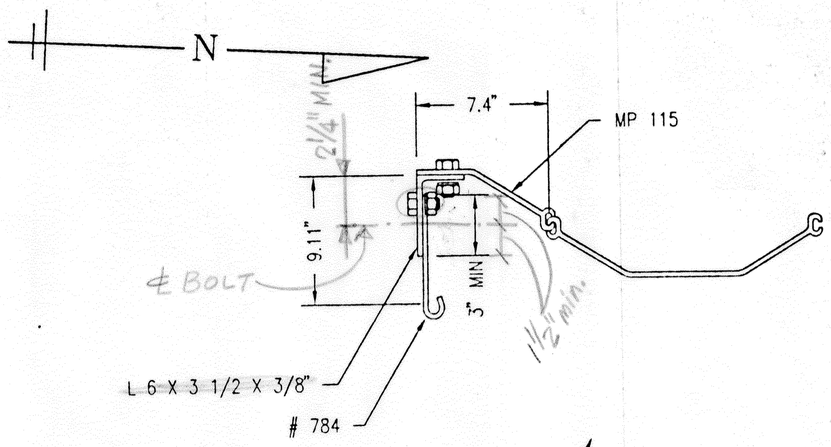
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA
LONDON AVE. OUTFALL CANAL.
HURRICANE PROTECTION HIGH LEVEL PLAN
SKYLINE STEEL CORP.
B & K CONSTRUCTION

DATE	AUG/12/94	CAD FILE No:	CAST-007	SCALE	1/24
DRAWN	J.ALMANRIC	CHECKED		SIZE	"C"

CASTEEL DWG: 01 OF 05 | REV. 1

626-1866





LIST OF MATERIAL

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- ALL CORNERS AND ALL TRANSITION PIECES SHALL BE BOLTED AS PER DETAILS SHOWN ON DRAWING USING 7/8" BOLTS -ASTM A325 TYPE 1.

PIECES No:	TYPE	QTY	LENGTH (FT)•	AREA (ft2)	NOTE
1	CZ101-B2-90°	1	21.75	39.24	
2 TO 781	CZ101	780	21.75	30607.69	
782	CZ101-B3-90°	1	21.75	39.24	
783	CZ101	1	21.75	39.24	
784	CZ101	0	21.75	0.00	USE 1 MALE FLANGE CUT FROM PCE. #1
TOTAL PCS CZ101-B2. REQ.		1			
TOTAL PCS CZ101-B3. REQ.		1			
TOTAL PCS CZ101 REQ.		781		TOTAL AREA (ft2) : 30725.41	
TOTAL PCS REQ.		783		TOTAL WEIGHT : 318.21 TONS	

• IF ADD. CUT OFF IS REQ'D, CONTRACTOR MAY ORDER LONGER LENGTHS THAN INDICATED.

GENERAL NOTES.

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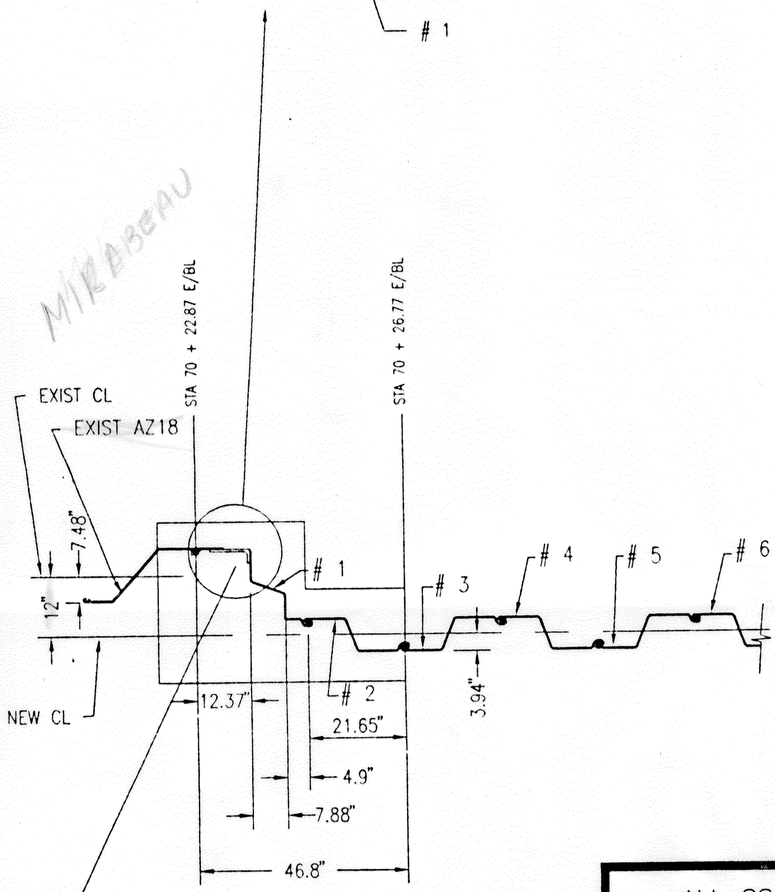
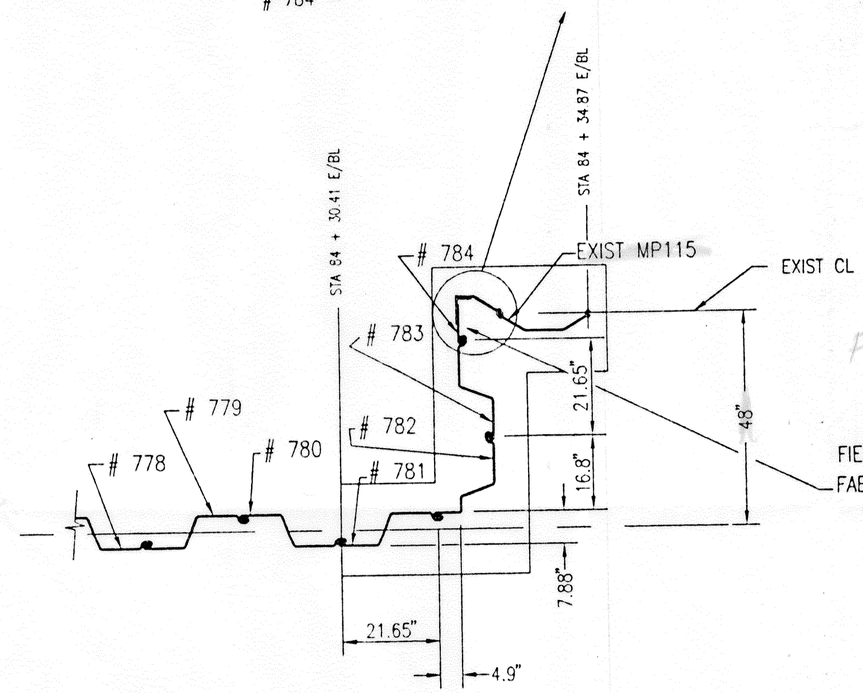


FIELD WORK: ADJUST DIMENSIONS IF REQ.
FABRICATE TRANSITION PCE BY BOLTING BENT PL WITH CUTTED AZ18 & CZ101-B2 CORNER #1



FIELD WORK: ADJUST DIMENSIONS IF REQ.
FABRICATE TRANS PCE BY BOLTING ANGLE WITH CZ101 FLANGE & CUT MP115.

ALL SSP ITEM #1
TO ITEM #784
TOP ELEVATION 5.75'
BOTTOM ELEVATION -16.0'

THIRD ANGLE PROJECTION

REVISION	DATE	REVISION	DATE
1	OCT/17/94	4	
2		5	
3		6	

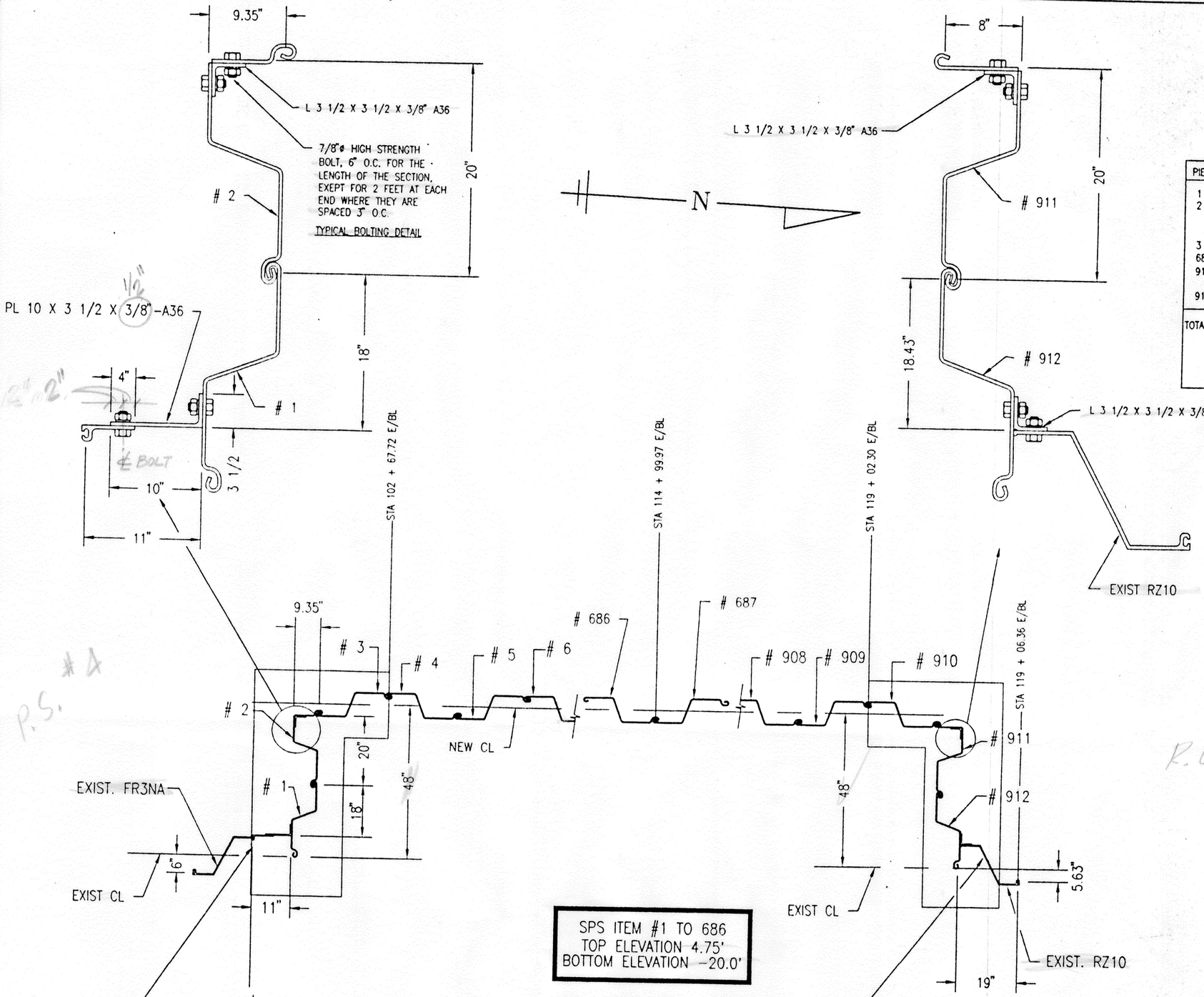
NOTICE
CONFIDENTIAL PROPERTY OF THE CASTEEL GROUP INC.

THE CASTEEL GROUP inc

CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA
LONDON AVE. OUTFALL CANAL.
HURRICANE PROTECTION HIGH LEVEL PLAN
SKYLINE STEEL CORP.
B & K CONSTRUCTION

DATE	AUG/12/94	CAD FILE No:	CAST-008	SCALE	1/24
DRAWN	J.ALMANRIC	CHECKED		SIZE	"C"

CASTEEL DWG: 02 OF 05 | REV. 1



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- ALL CORNERS AND ALL TRANSITION PIECES SHALL BE BOLTED AS PER DETAILS SHOWN ON DRAWING USING 7/8" BOLTS -ASTM A325 TYPE 1.

PIECES No:	TYPE	QTY	LENGTH (FT)*	AREA (ft2)	NOTE
1	CZ101	1	24.75	44.65	
2	CZ101 FABR. 90° CORNER	1	24.75	44.65	USE 1 PCE. + 1 FEMALE FLANGE
3 TO 686	CZ101	684	24.75	30542.74	
687 TO 910	CZ101	224	26.75	10810.57	
911	CZ101 FABR. 90° CORNER	1	26.75	96.52	USE 1 PCE. + 1 MALE FLANGE
912	CZ101	1	26.75	48.26	
TOTAL PCS CZ101 REQ.		913			
				TOTAL AREA (ft2) : 41587.39	
	TOTAL PCS REQ.	913		TOTAL WEIGHT : 430.70 TONS	

* IF ADD. CUT OFF IS REQ'D, CONTRACTOR MAY ORDER LONGER LENGTHS THAN INDICATED.

GENERAL NOTES

THEORITICAL WALL LENGTHS AND SOME STATIONS HAVE BEEN SLIGHTLY MODIFIED TO ACCOMODATE CASTEEL'S SECTIONS WIDTH. THESE VARIATIONS ON THE SHOP DRAWINGS ARE NOT SIGNIFICANT AND GENERALLY LESS THAN ONE FOOT.
USUAL DRIVING TOLERANCES FOR INTERLOCKED S.S.P. IS ±3% OF THEORITICAL WIDTH.
THEREFORE SOME FIELD ADJUSTMENTS ARE POSSIBLE AND MAY BE REQUIRED IF EXACT STATIONS LOCATIONS ARE TO BE MEET AT THE END OF A GIVEN WALL.

SPS ITEM #1 TO 686
TOP ELEVATION 4.75'
BOTTOM ELEVATION -20.0'

SPS ITEM #687 TO 912
TOP ELEVATION 4.75'
BOTTOM ELEVATION -22'-0

FIELD WORK: ADJUST DIMS
IF REQ'D, CUT RZ10 FLANGE OFF & FABRICATE TEE BY BOLTING WITH L 3 1/2 X 3 1/2 X 3/8" A36 AND CZ101 PC # 912.

FIELD WORK: ADJUST DIMENSIONS IF REQ.
CUT FR3NA FLANGE AND FABRICATE TEE BY BOLTING WITH BENT PL 10 X 3 1/2 X 3/8" AND CZ 101 -PC # 1

CONTRACTOR MAY PARTIALLY CUT TOP OF S.S.P. AT EXACT STATIONS LOCATION WHERE TOP ELEVATION CHANGES.

THIRD ANGLE PROJECTION

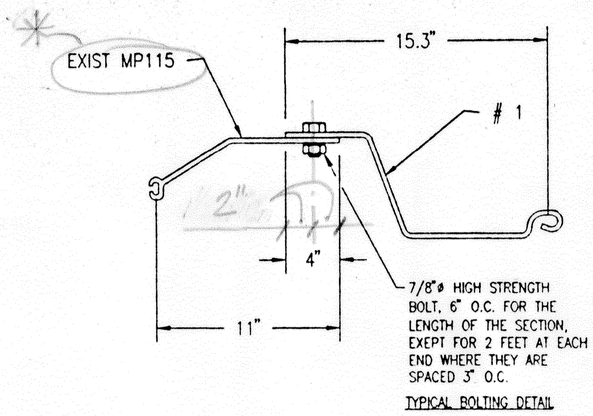
REVISION		DATE	REVISION		DATE
1		OCT/17/94	4		
2			5		
3			6		

NOTICE
CONFIDENTIAL PROPERTY OF THE CASTEEL GROUP INC.

THE CASTEEL GROUP inc

CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA
LONDON AVE. OUTFALL CANAL.
HURRICANE PROTECTION HIGH LEVEL PLAN
SKYLINE STEEL CORP.
B & K CONSTRUCTION

DATE AUG/12/94	CAD FILE No: CAST-009	SCALE 1/24	
DRAWN J.ALMANRIC	CHECKED	SIZE "C"	
CASTEEL DWG: 03 OF 05		REV.	1



TYPICAL BOLTING DETAIL

LIST OF MATERIAL

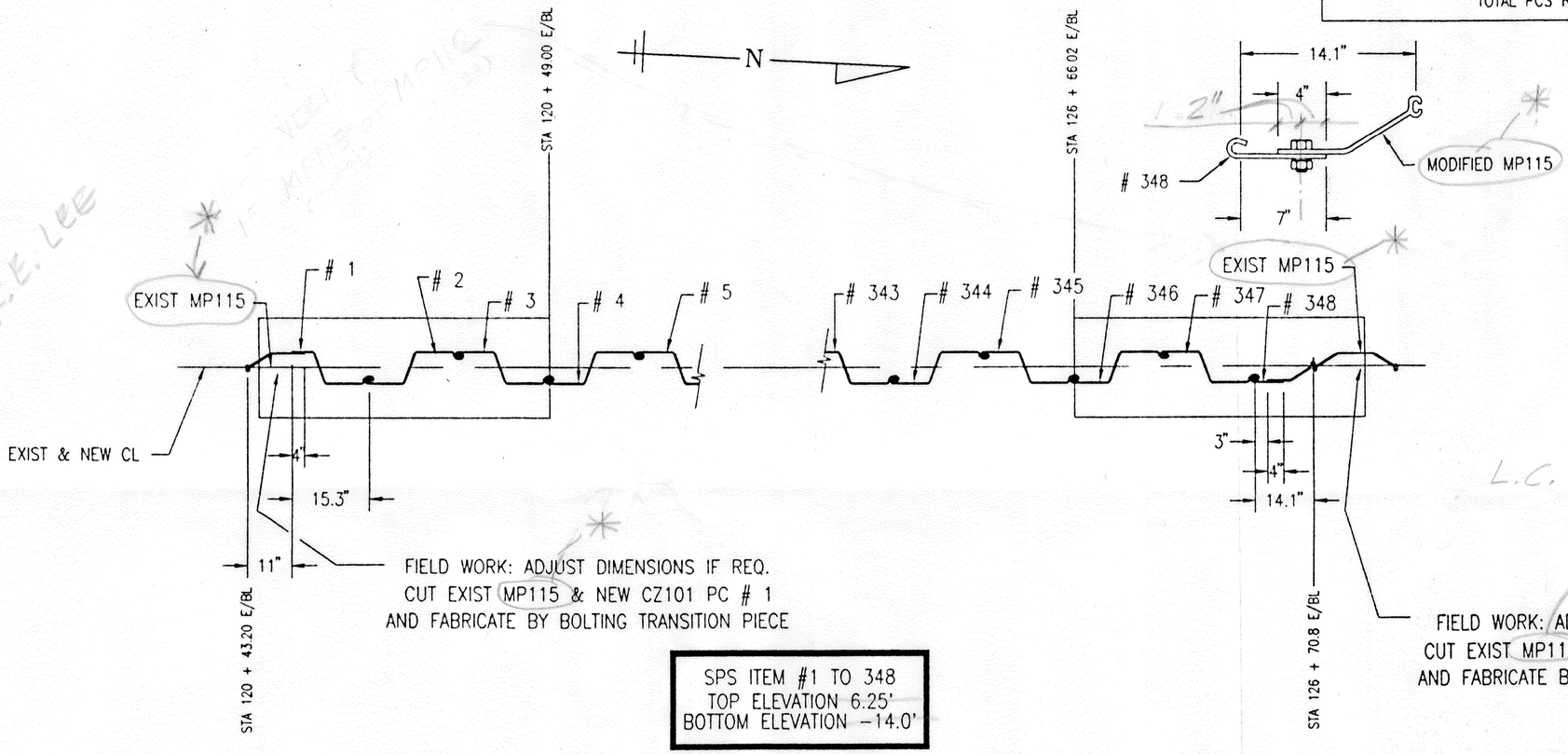
- ALL STEEL SHEET PILING SHALL BE AS MANUFACTURED BY THE CASTEEL GROUP INC.
- STEEL QUALITY : TO MEET ASTM A572 GR.50
- THIS PROPOSAL & LAYOUT IS SUBJECT TO CUSTOMER REVIEW & ACCEPTANCE.
- ALL CORNERS AND ALL TRANSITION PIECES SHALL BE BOLTED AS PER DETAILS SHOWN ON DRAWING USING 7/8" BOLTS –ASTM A325 TYPE 1.

PIECES No:	TYPE	QTY	LENGTH (FT)*	AREA (ft2)	NOTE
1 TO 348	CZ101	348	20.25	12713.96	
TOTAL PCS CZ101 REQ.		348			
			TOTAL AREA (ft2) : 12713.96		
	TOTAL PCS REQ.	348	TOTAL WEIGHT : 131.67 TONS		

* IF ADD. CUT OFF IS REQ'D, CONTRACTOR MAY ORDER LONGER LENGTHS THAN INDICATED.

GENERAL NOTES.

THEORITICAL WALL LENGTHS AND SOME STATIONS HAVE BEEN SLIGHTLY MODIFIED TO ACCOMODATE CASTEEL'S SECTIONS WIDTH. THESE VARIATIONS ON THE SHOP DRAWINGS ARE NOT SIGNIFICANT AND GENERALLY LESS THAN ONE FOOT.
USUAL DRIVING TOLERANCES FOR INTERLOCKED S.S.P. IS ±3% OF THEORITICAL WIDTH.
THEREFORE SOME FIELD ADJUSTMENTS ARE POSSIBLE AND MAY BE REQUIRED IF EXACT STATIONS LOCATIONS ARE TO BE MEET AT THE END OF A GIVEN WALL.



FIELD WORK: ADJUST DIMENSIONS IF REQ.
CUT EXIST MP115 & NEW CZ101 PC # 1
AND FABRICATE BY BOLTING TRANSITION PIECE

SPS ITEM #1 TO 348
TOP ELEVATION 6.25'
BOTTOM ELEVATION –14.0'

FIELD WORK: ADJUST DIMENSIONS IF REQ.
CUT EXIST MP115 & NEW CZ101 PC # 348
AND FABRICATE BY BOLTING TRANSITION PIECE

* GEN. CONTRACTOR TO FIELD VERIFY SIZE OF EXIST. PILING THIS LOCATION

THIRD ANGLE PROJECTION

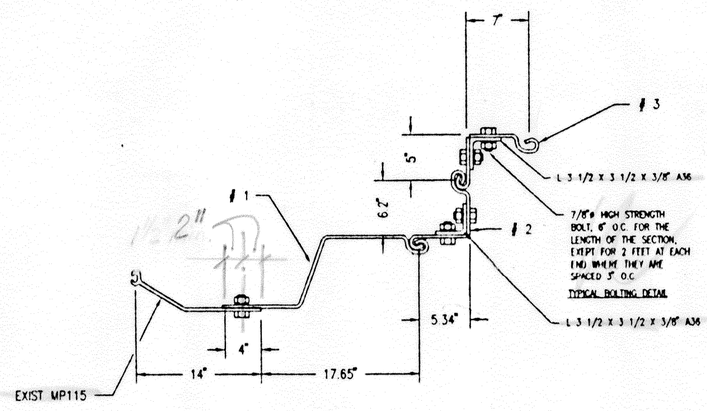
REVISION	DATE	REVISION	DATE
1	OCT/17/94	4	
2		5	
3		6	

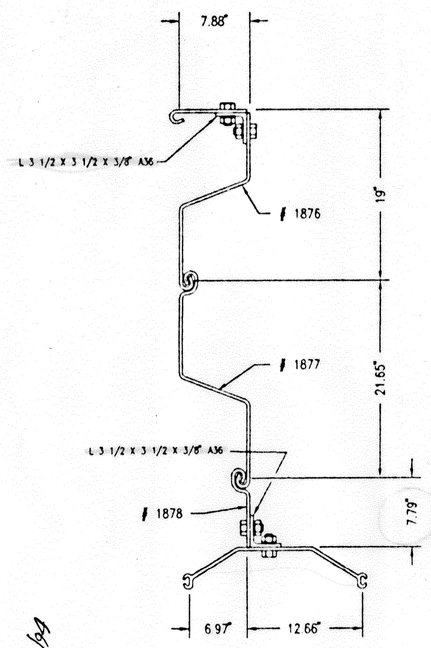
THE CASTEEL GROUP Inc

CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA
LONDON AVE. OUTFALL CANAL.
HURRICANE PROTECTION HIGH LEVEL PLAN
SKYLINE STEEL CORP.
B & K CONSTRUCTION

DATE	AUG/12/94	CAD FILE No:	CAST-010	SCALE	1/24
DRAWN	J.ALMANRIC	CHECKED		SIZE	"C"

CASTEEL DWG: 04 OF 05 | REV. 1



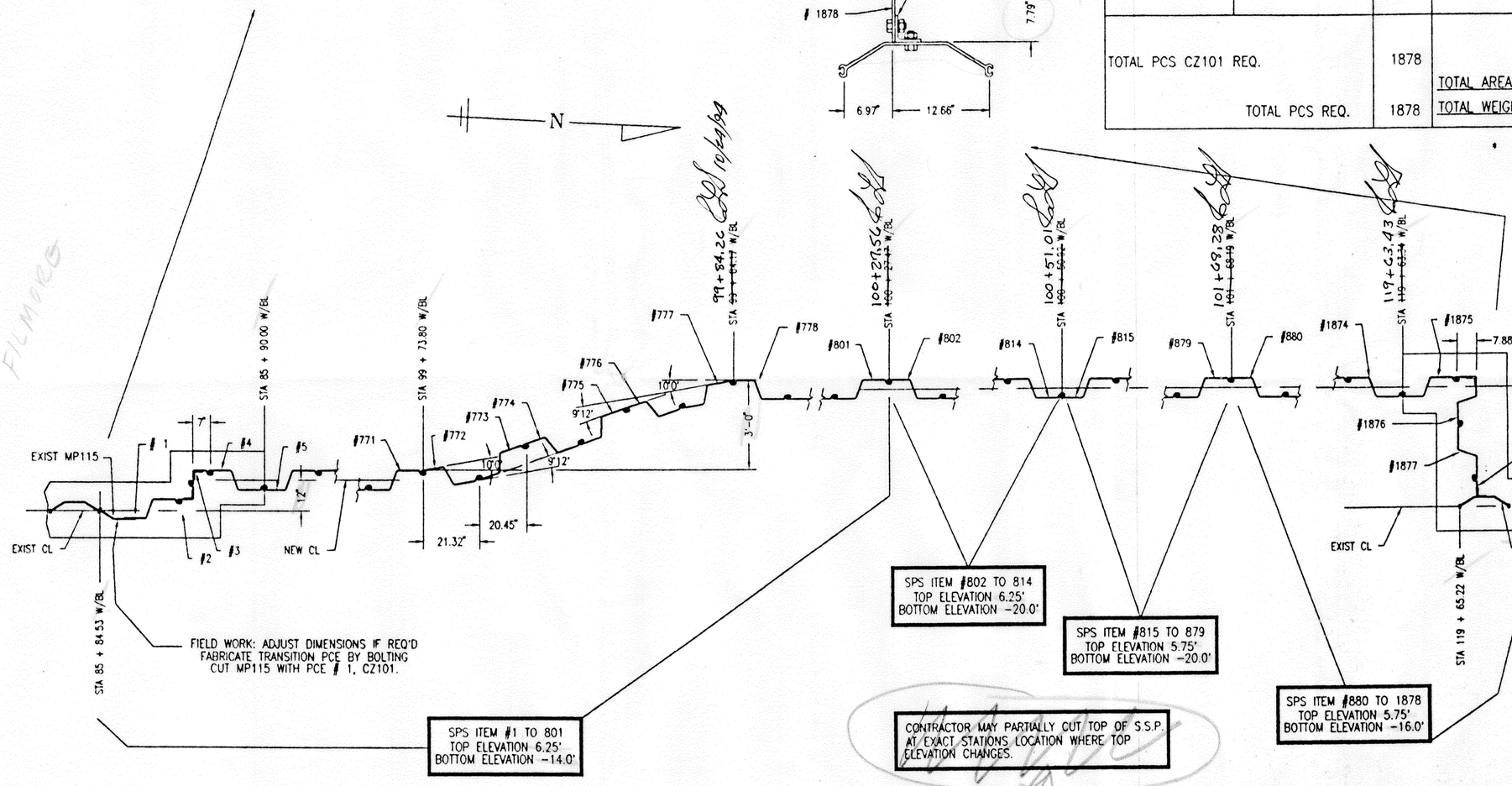


LIST OF MATERIAL

- ALL STEEL SHEET PILING SHALL BE AS MANUFACTURED BY THE CASTEEL GROUP INC.
- STEEL QUALITY : TO MEET ASTM A572 GR.50
- THIS PROPOSAL & LAYOUT IS SUBJECT TO CUSTOMER REVIEW & ACCEPTANCE.
- ALL CORNERS AND ALL TRANSITION PIECES SHALL BE BOLTED AS PER DETAILS SHOWN ON DRAWING USING 7/8" BOLTS -ASTM A325 TYPE 1.

PIECES No:	TYPE	QTY	LENGTH (FT)*	AREA (ft2)	NOTE
1	CZ101	1	20.25	36.53	
2 & 3	CZ101- FAB 90° CORNER	2	20.25	73.07	
4 TO 801	CZ101	798	20.25	29154.43	
802 TO 814	CZ101	13	26.25	615.67	
815 TO 879	CZ101	65	25.75	3019.72	
880 TO 1875	CZ101	996	21.75	39083.66	
1876	CZ101	1	21.75	58.85	REQ 1 PCE + 1 MALE FLANGE
1877	CZ101	1	21.75	39.24	
1878	CZ101	1	21.75	19.63	SHIP REMAINING FROM PCE # 1876
TOTAL PCS CZ101 REQ.		1878	TOTAL AREA (ft2) : 72100.81		
TOTAL PCS REQ.		1878	TOTAL WEIGHT : 746.72 TONS		

* IF ADD. CUT OFF IS REQ'D, CONTRACTOR MAY ORDER LONGER LENGTHS THAN INDICATED.



GENERAL NOTES.

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THEREFORE SOME FIELD ADJUSTMENTS ARE POSSIBLE AND MAY BE REQUIRED IF EXACT STATIONS LOCATIONS ARE TO BE MEET AT THE END OF A GIVEN WALL.

REMOVE NOTE

R.E. LEE

THIRD ANGLE PROJECTION

REVISION	DATE	REVISION	DATE
1	OCT/17/94	4	
2		5	
3		6	

THE CASTEEL GROUP Inc

CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA
LONDON AVE. OUTFALL CANAL.
HURRICANE PROTECTION HIGH LEVEL PLAN
SKYLINE STEEL CORP.
B & K CONSTRUCTION

DATE	AUG/12/94	CAD FILE No.	CAST-011	SCALE	1/36
DRAWN	J.ALMANRIC	CHECKED		SIZE	"C"

CASTEEL DWG: 05 OF 05 | REV. 1

ROUTING OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE FOR APPROVAL

(Used to route ENG Form 4025 with items attached. Not to become a part of the Contractor's record.)

	TO:	FROM:	DATE
1	C/Const Div	Area Engineer	10/3/94

The attached items listed on ENG Form 4025 are forwarded for approval action.

CONTRACT NUMBER	CONTRACTOR
94-C-0079	B & K Const Co. Inc.
TRANSMITTAL NUMBERS Item #12 Pile Driving Equipment	**PROJECT TITLE AND LOCATION** London Ave Canal Floodwall - Mirabeau Ave to Leon C. Simon

COMMENTS (Attach additional sheet, if necessary.)

Request your office review the attached pile driving equipment submittal for the subject contract. Furnish any comments to NOAD by COB 11 Oct 94. POC is Chris Wagner x1424

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
1	Dennis Dubon, Supv C/V Engr	

	TO:	FROM:	DATE
2	C/Engineering Div Attn: Barmby	C/Construction Div Berry/1240	OCT - 3 1994

COMMENTS (Attach additional sheet, if necessary)

Request your office review attached submittal and provide comments to Const. Div by COB 11 Oct 94

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
	RICHARD T. HILL	

	TO:	FROM:	DATE
3	C/Const Div	C/Engr Div	10/6/94

COMMENTS (Attach additional sheet, if necessary)

Recommended for approval

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
1	W. Eugene Tickner C/Engr Div	

	TO:	FROM:	DATE
4			

The following action codes are given to items listed on ENG Form 4025:

ACTION CODES

A - APPROVED AS SUBMITTED.

B - APPROVED, EXCEPT AS NOTED ON DRAWINGS. RESUBMISSION NOT REQUIRED.

C - APPROVED, EXCEPT AS NOTED ON DRAWINGS. REFER TO ATTACHED SHEET. RESUBMISSION REQUIRED.

D - WILL BE RETURNED BY SEPARATE CORRESPONDENCE.

E - DISAPPROVED (SEE ATTACHED)

F - RECEIPT ACKNOWLEDGED

G - OTHER (specify)

ACTION CODES TO BE INSERTED IN COLUMN G, SECTION I, ENG FORM 4025 (Attach sheets, when required.)

ITEM NO. (Taken from ENG Form 4025)								
CODE GIVEN								

REMARKS

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE

PILE DRIVING EQUIPMENT

London Avenue Canal

We propose to use a MKT V-5 Vibratory Pile Driver/Extractor to drive and pull the steel sheet pile on this project. We will use an HP105B Power Pack to power the machine.

We will use a 20 Ton "Unit" Crawler-type Crane with 60' of boom to drive and pull the piling. We may have to use a 50 ton 5299 American for this work but are planing to begin the job with the Unit crane.

We will be using a pile puller to gain leverage to break the interlocks of the old sheets.

We will utilize a 3000 lb. hair pin hammer to pin the new sheet piling.

We have a 40' I-beam template we will use to align the sheet piling.

A 200 Komatsu hydraulic backhoe may be used to assist in aligning the piling.

A 200 amp AC/DC portable diesel welding machine will be used to weld the re-steel on top of the piling.

ROUTING AND TRANSMITTAL S

Date 10/6/94

TO: (Name, office symbol, room number, building, Agency/Post)	Initials	Date
1. Angela Desoto		
2.		
3.		
4.		
5.		

	Actior		File		Note and Return
	Approval		For Clearance		Per Conversation
	As Requested		For Correction		Prepare Reply
	Circulate		For Your Information		See Me
	Comment		Investigate		Signature
	Coordination		Justify		

REMARKS

NO COMMENT
Please route thru Rodney.

DO NOT use this form as a RECORD of approvals, concurrences, disposals, clearances, and similar actions

FROM: (Name, org. symbol, Agency/Post)	Room No.—Bldg.
Frank Vojkovich	Phone No. 1034

5041-102

GPO : 1987 0 - 196-409

OPTIONAL FORM 41 (Rev. 7-76)
Prescribed by GSA
FPMR (41 CFR) 101-11.206

ROUTING OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, AND MANUFACTURER'S CERTIFICATES OF COMPLIANCE FOR APPROVAL

(Used to route ENG Form 4025 with items attached. Not to become a part of the Contractor's record.)

	TO:	FROM:	DATE
1	C/ Const Div	Area Engineer	10/3/94

The attached items listed on ENG Form 4025 are forwarded for approval action.

CONTRACT NUMBER	CONTRACTOR
94-C-0079	B & K Const Co. Inc.
TRANSMITTAL NUMBERS Item #12 Pile Driving Equipment	**PROJECT TITLE AND LOCATION** London Ave Canal Floodwall - Mirabeau Ave to Lake C. Simon

COMMENTS *(Attach additional sheet, if necessary.)*
Request your office review the attached pile driving equipment submittal for the subject contract. Furnish any comments to NOAD by COB 11 Oct 94. POC is Chris Wagner x1424

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
1	Dennis Dyhon, Supv Civ Engr	

	TO:	FROM:	DATE
2	C/Engineering Div Attn: Bauny	C/Construction Div Surrey / 1240 OCT	

COMMENTS *(Attach additional sheet, if necessary.)*
Request your office review attached submittal and provide comments to Constr. Div by COB 11 Oct 94

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
	RICHARD T. HILL	

	TO:	FROM:	DATE
3			

COMMENTS *(Attach additional sheet, if necessary.)*

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE

	TO:	FROM:	DATE
4			

The following action codes are given to items listed on ENG Form 4025:

ACTION CODES

A - APPROVED AS SUBMITTED.

B - APPROVED, EXCEPT AS NOTED ON DRAWINGS. RESUBMISSION NOT REQUIRED.

C - APPROVED, EXCEPT AS NOTED ON DRAWINGS. REFER TO ATTACHED SHEET. RESUBMISSION REQUIRED.

D - WILL BE RETURNED BY SEPARATE CORRESPONDENCE.

E - DISAPPROVED (SEE ATTACHED)

F - RECEIPT ACKNOWLEDGED

G - OTHER *(specify)*

ACTION CODES TO BE INSERTED IN COLUMN G, SECTION I, ENG FORM 4025 *(Attach sheets, when required.)*

ITEM NO. (Taken from ENG Form 4025)								
CODE GIVEN								

REMARKS

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE

*U.S. G.P.O. 1980-621-246/193

PILE DRIVING EQUIPMENT

London Avenue Canal

We propose to use a MKT V-5 Vibratory Pile Driver/Extractor to drive and pull the steel sheet pile on this project. We will use an HP105B Power Pack to power the machine.

We will use a 20 Ton "Unit" Crawler-type Crane with 60' of boom to drive and pull the piling. We may have to use a 50 ton 5299 American for this work but are planing to begin the job with the Unit crane.

We will be using a pile puller to gain leverage to break the interlocks of the old sheets.

We will utilize a 3000 lb. hair pin hammer to pin the new sheet piling.

We have a 40' I-beam template we will use to align the sheet piling.

A 200 Komatsu hydraulic backhoe may be used to assist in aligning the piling.

A 200 amp AC/DC portable diesel welding machine will be used to weld the re-steel on top of the piling.

ROUTING OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE FOR APPROVAL

(Used to route ENG Form 4025 with items attached. Not to become a part of the Contractor's record.)

	TO:	FROM:	DATE
1	C/Const Div	Area Engineer, New Orleans	9/29/94

The attached items listed on ENG Form 4025 are forwarded for approval action.

CONTRACT NUMBER	CONTRACTOR
94-C-0079	B & K Const. Co., Inc

TRANSMITTAL NUMBERS	PROJECT TITLE AND LOCATION
#23 – Temporary sheet pile retaining wall analysis for ramp	London Ave Canal Floodwall – Mirabeau Ave to Leon C. Simon

COMMENTS (Attach additional sheet, if necessary)

Request your office review the attached sheet pile retaining wall analysis for ramp 2 levee and Robert E. Lee (approx. Sta. 120+30) E B/L. Furnish any comments to NOAO by COB 12 Oct 94. POC is Chris Wagner x2720.

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
1	Dennis Duhon, Supv C.O. Engr.	

	TO:	FROM:	DATE
2	C/Engineering Div Attn: Baumy	C/Construction Div Attn: Berry 1240	30 Oct 94

COMMENTS (Attach additional sheet, if necessary)

Request your office review attached submittal and provide comments to Constr. Div by COB, 11 Oct 94.

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
	RICHARD T. HILL	

	TO:	FROM:	DATE
3	C/Const Div	C/Engr	10/6/94

COMMENTS (Attach additional sheet, if necessary)

Not recommended for approval. Sheet pile analysis not adequate Please resubmit.

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
1	W. Eugene Tickner C/Engr Div	

	TO:	FROM:	DATE
4			

The following action codes are given to items listed on ENG Form 4025:

ACTION CODES

A - APPROVED AS SUBMITTED.

B - APPROVED, EXCEPT AS NOTED ON DRAWINGS. RESUBMISSION NOT REQUIRED.

C - APPROVED, EXCEPT AS NOTED ON DRAWINGS. REFER TO ATTACHED SHEET. RESUBMISSION REQUIRED.

D - WILL BE RETURNED BY SEPARATE CORRESPONDENCE.

E - DISAPPROVED (SEE ATTACHED)

F - RECEIPT ACKNOWLEDGED

G - OTHER (specify)

ACTION CODES TO BE INSERTED IN COLUMN G, SECTION I, ENG FORM 4025 (Attach sheets, when required.)

ITEM NO. (Taken from ENG Form 4025)								
CODE GIVEN								

REMARKS

SEP 30 1994

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE

C.L. SLOAN ENGINEERING — MANDEVILLE, LOUISIANA

BY CLS DATE 9-22-94 SUBJECT RAMP SHEET NO. 1 OF 2

CHKD. BY ____ DATE ____ CLIENT BEK JOB NO. ____

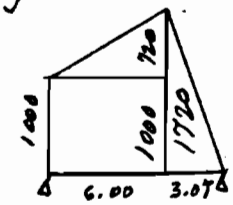
DEPTH	ELEV		C	
-0-	5.5			
4	9.5	V. COMPACT TAN GRAY CLAYEY SILT	2000 psf	} AV. 1550 for top 6'
7	12.5	D. TAN GRAY CLAYEY SAND	1000	
10	15.5	S. GRAY SILTY CLAY	300	} AV. 900 for next 16'
13	18.5	M. SI. DK. GRAY CLAY	1000	
17	23.0	SL. BR. ORG. CLAY	1500	
20	25.5	S. GRAY SILTY CLAY	400	

EQUIP. SURCHG. 1000 psf

$\gamma = 120$ (assumed)

$2C = 2 \times 900 = 1800$

$\gamma H = 120 \times 16 = 1920$ } 3720



EQUIV. BEAM

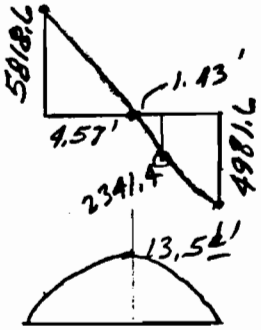
Use steel sheets

PZ-22 (lightest)

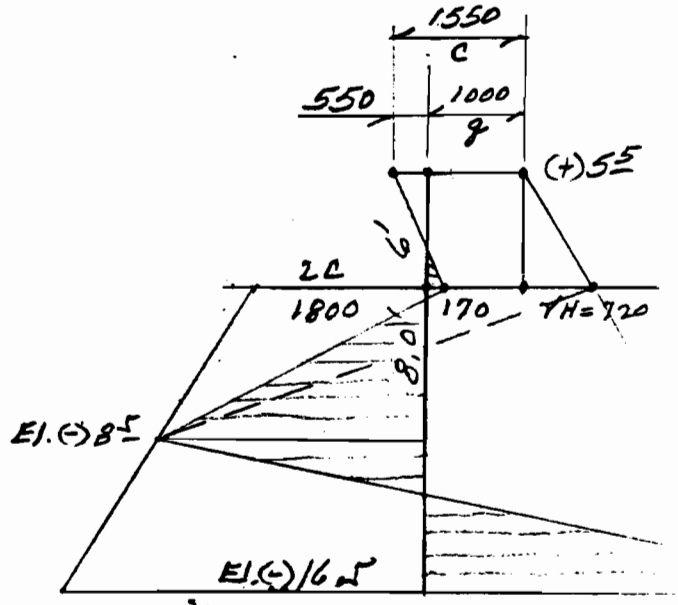
$I = 18.1$ in^4

$f = \frac{13.5 \times 12}{18.1} = 8.9$ ksi

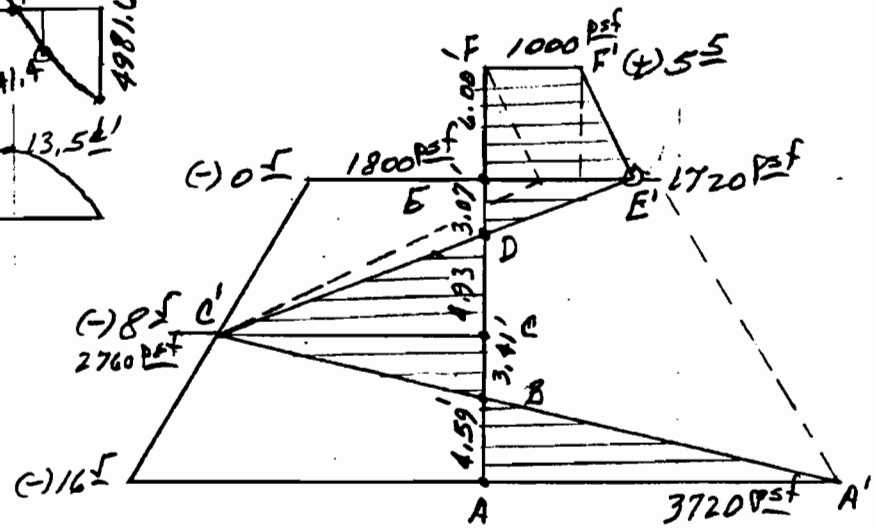
ok



WITHOUT COHESION REPRESENTS WORST CONDITION FOR SHEET PILE STRESSES.



— WITH COHESION —



— COHESION OMITTED —

STATE OF LOUISIANA
CHARLES L. SLOAN
REG. No. 5597
REGISTERED
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING

C.L. SLOAN ENGINEERING — MANDEVILLE, LOUISIANA

BY CLS DATE 9-22-94 SUBJECT RAMP SHEET NO. 2 OF 2

CHKD. BY ____ DATE ____ CLIENT B&K JOB NO. ____

ELEV.	DESCRIPTION	COHESION	REF: BORING #11
(+) 5.5 TO (+) 1.5	V. Compact tan gray clayey silt	2000 psf	
(+) 1.5 TO (-) 1.5	Dense tan gray clayey sand	1000	use 3V.
(-) 1.5 TO (-) 4.5	Soft Gray silty clay	300	
(-) 4.5 TO (-) 7.5	Med. stiff dark gray clay	1000	
(-) 7.5 TO (-) 12.0	stiff brown org. clay	1500	
(-) 12.0 TO (-) 14.5	soft gray silty clay	400	
(-) 14.5 TO (-) 20.5	V. loose gray silty clayey sand	200	

Assume $\gamma = 120$ pcf

$q = 1000$ psf

$\frac{480+720}{2} \times 2 = 1200$

$\frac{1}{2} \times 720 \times 1.42 = 511$

$\frac{1}{2} \times 2320 \times 4.05 = 4698$

6409 #/'

$\frac{1}{2} \times 2840 \times 10.53 = 14,953$

$F/S = \frac{14,953}{6409} = 2.3$ ok

$240 \times 2 \times \frac{1}{2} \times 15.32 = 3677$

$480 \times 2 \times 15.45 = 15,024$

$720 \times 1.42 \times \frac{1}{2} \times 14.18 = 7249$

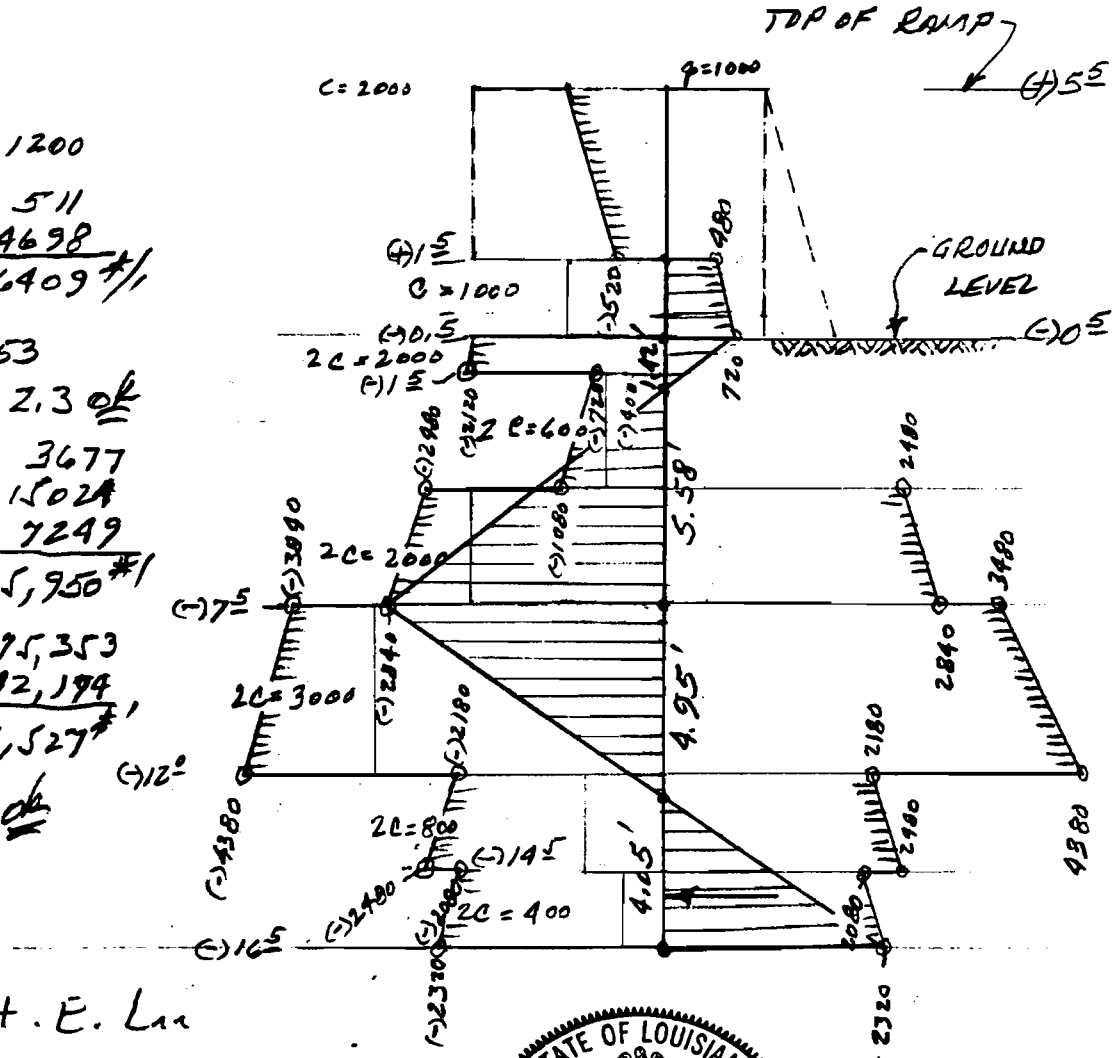
overturn $M_o = 25,950$ #'

$2840 \times 5.58 \times \frac{1}{2} \times 9.51 = 75,353$

$2840 \times 4.95 \times \frac{1}{2} \times 6.00 = 42,194$

Restrain $M_o = 117,527$ #'

$F/S = \frac{117,527}{25,950} = 4.5$ ok



Ramp @ Robert E. Lee & Levee. (Approx. Sta. 120+30 E B/L.)

STATE OF LOUISIANA
CHARLES L. SLOAN
REG. No. 5597
REGISTERED
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING

ROUTING AND TRANSMITTAL SLI. Date 10/6/94

TO: (Name, office symbol, room number, building, Agency/Post)	Initials	Date
1. Angela Desoto		
2.		
3.		
4.		
5.		

	Action		File		Note and Return
	Approval		For Clearance		Per Conversation
	As Requested		For Correction		Prepare Reply
	Circulate		For Your Information		See Me
	Comment		Investigate		Signature
	Coordination		Justify		

REMARKS

I called Charles Sloan, AE and faxed him information from GDM. I told him the analysis for the sheet pile wall is not adequate. He said he will revise calculations. I talked to Chris Wagner. Chris said he will submit ~~new calcula~~ additional information and extend the submittal date on this submittal to 17 Oct.

DO NOT use this form as a RECORD of approvals, concurrences, disposals, clearances, and similar actions

FROM: (Name, org. symbol, Agency/Post)	Room No.—Bldg.
Frank Vojkovich	Phone No. 1034

5041-102

GPO : 1987 O - 196-409

OPTIONAL FORM 41 (Rev. 7-76)
Prescribed by GSA
FPMR (41 CFR) 101-11.206

ROUTING OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, O... MANUFACTURER'S CERTIFICATES OF COMPLIANCE FOR APPROVAL

(Used to route ENG Form 4025 with items attached. Not to become a part of the Contractor's record.)

	TO:	FROM:	DATE
1	C/Const Div	Area Engineer, New Orleans	9/29/94

The attached items listed on ENG Form 4025 are forwarded for approval action.

CONTRACT NUMBER	CONTRACTOR
94-C-0079	B & K Const. Co., Inc
TRANSMITTAL NUMBERS #23 – Temporary sheet pile retaining wall analysis for ramp	**PROJECT TITLE AND LOCATION** London Ave Canal Floodwall – Mirabeau Ave to Leon C. Simon

COMMENTS *(Attach additional sheet, if necessary.)*
Request your office review the attached sheet pile retaining wall analysis for ramp @ levee and Robert E. Lee (approx. Sta. 120+30) E B/L. Furnish any comments to NOAO by COB 12 Oct 94. POC is Chris Wagner x[illegible]

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
1	Dennis Duhon, Supv C.O. Engr.	

	TO:	FROM:	DATE
2	C/Engineering Div Attn: Bauny	C/Construction Div Attn: Berry 1240	30 Sep 94

COMMENTS *(Attach additional sheet, if necessary.)*
Request your office review attached submittal and provide comments to Constr. Div by COB 11 Oct 94.

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
	RICHARD [illegible]	

	TO:	FROM:	DATE
3			

COMMENTS *(Attach additional sheet, if necessary.)*

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE

	TO:	FROM:	DATE
4			

The following action codes are given to items listed on ENG Form 4025:

ACTION CODES

A - APPROVED AS SUBMITTED.

B - APPROVED, EXCEPT AS NOTED ON DRAWINGS. RESUBMISSION NOT REQUIRED.

C - APPROVED, EXCEPT AS NOTED ON DRAWINGS. REFER TO ATTACHED SHEET. RESUBMISSION REQUIRED.

D - WILL BE RETURNED BY SEPARATE CORRESPONDENCE.

E - DISAPPROVED (SEE ATTACHED)

F - RECEIPT ACKNOWLEDGED

G - OTHER *(specify)*

ACTION CODES TO BE INSERTED IN COLUMN G, SECTION I, ENG FORM 4025 *(Attach sheets, when required.)*

ITEM NO. (Taken from ENG Form 4025)								
CODE GIVEN								

REMARKS

SEP [illegible]

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE

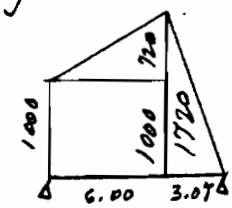
DEPTH	ELEV		C	
-0-	5.5			
4	9.5	V. COMPACT TAN GRAY CLAYEY SILT	2000 psf	AV. 1550 for top 6'
7	12.5	D. TAN GRAY CLAYEY SAND	1000	
10	15.5	S. GRAY SILTY CLAY	300	AV. 900 for next 16'
13	18.5	M. SI. DK. GRAY CLAY	1000	
17	23.0	SI. BR. ORG. CLAY	1500	
20	25.5	S. GRAY SILTY CLAY	400	

EQUIP. SURCHG 1000 psf

$\gamma = 120$ (assumed)

$2C = 2 \times 900 = 1800$

$\gamma H = 120 \times 16 = 1920$ } 3720



EQUIV. BEAM

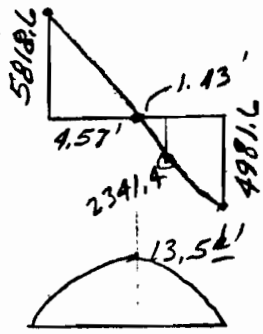
Use steel sheets

PZ-22 (lightest)

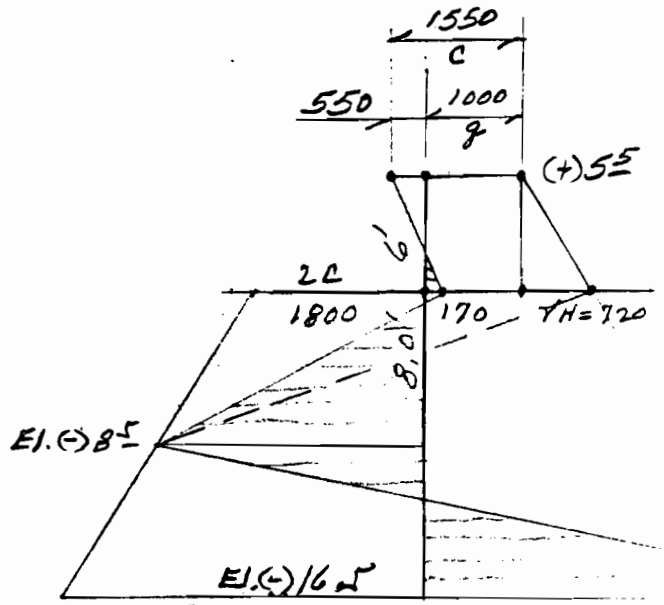
$I = 18.1$ in^3

$f = \frac{13.5 \times 12}{18.1} = 8.95$ ksi

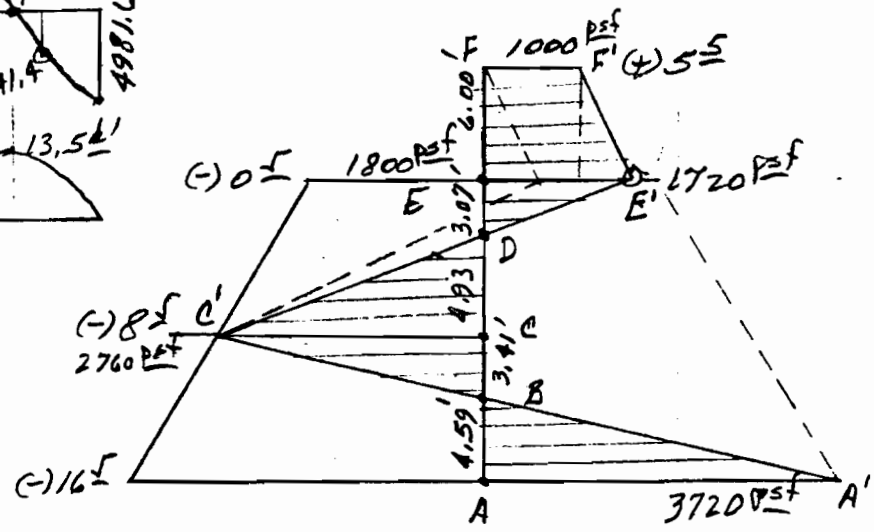
ok



WITHOUT COHESION REPRESENTS WORST CONDITION FOR SHEET PILE STRESSES.



— WITH COHESION —



— COHESION OMITTED —

STATE OF LOUISIANA
CHARLES L. SLOAN
REG. No. 5597
REGISTERED
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING

C.L. SLOAN ENGINEERING — MANDEVILLE, LOUISIANA

BY ELS DATE 9-22-94 SUBJECT RAMP SHEET NO. 2 OF 2

CHKD. BY ____ DATE ____ CLIENT BEK JOB NO. ____

ELEV.	DESCRIPTION	COHESION	REF: BORING #1
(+) 5.5 TO (+) 1.5	V. Compact tan gray clayey silt	2000 psf	use av.
(+) 1.5 TO (-) 1.5	Dense tan gray clayey sand	1000	
(-) 1.5 TO (-) 4.5	Soft Gray silty clay	300	
(-) 4.5 TO (-) 7.5	Med. stiff dark gray clay	1000	
(-) 7.5 TO (-) 12.0	stiff brown org. clay	1500	
(-) 12.0 TO (-) 14.5	soft gray silty clay	400	
(-) 14.5 TO (-) 20.5	V. loose gray silty clayey sand	200	

Assume $\gamma = 120$ pcf

$q = 1000$ psf

$\frac{480+720}{2} \times 2 = 1200$

$\frac{1}{2} \times 720 \times 1.42 = 511$

$\frac{1}{2} \times 2320 \times 4.05 = 4698$

6409 #/'

$\frac{1}{2} \times 2840 \times 10.53 = 14,953$

$F/S = \frac{14953}{6409} = 2.3$ ok

$240 \times 2 \times \frac{1}{2} \times 15.32 = 3677$

$480 \times 2 \times 15.45 = 15024$

$720 \times 1.42 \times \frac{1}{2} \times 14.18 = 7249$

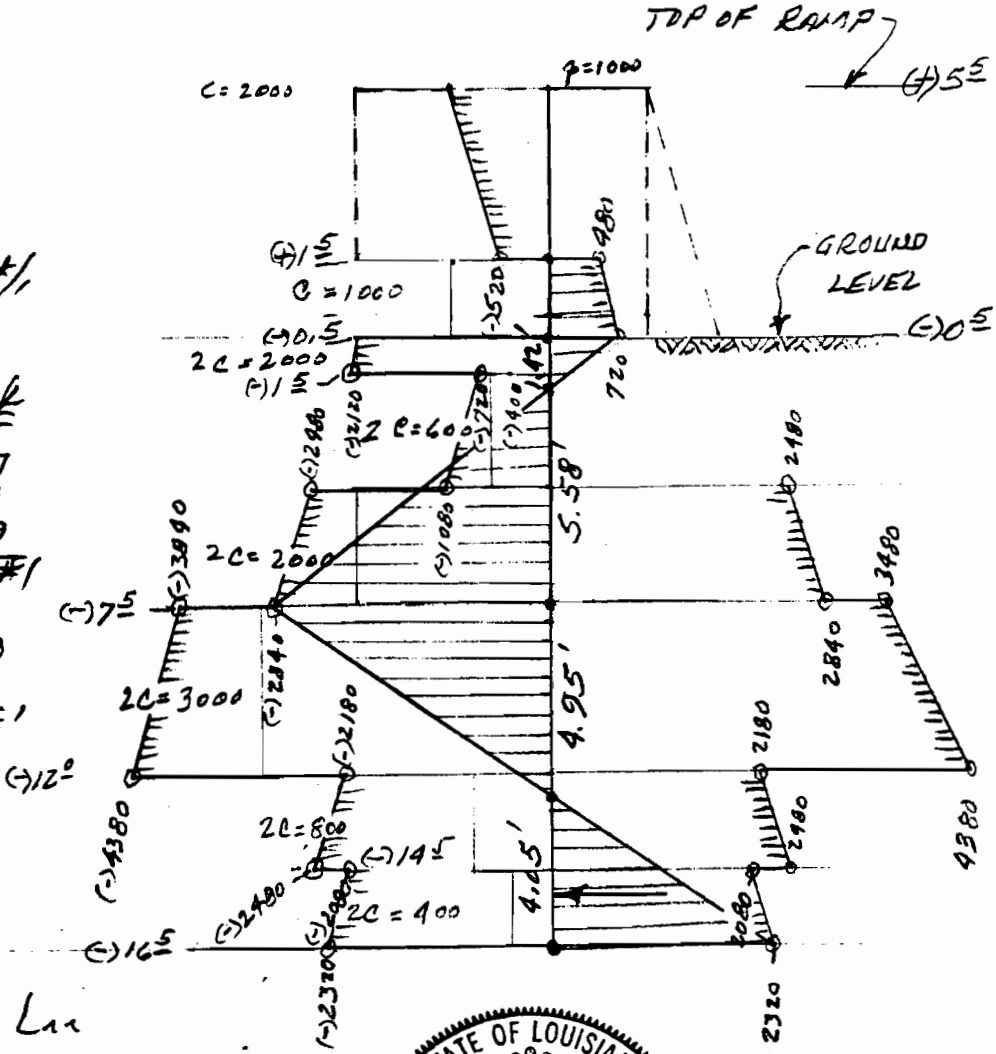
overturn $M_o = 25,950$ #'

$2840 \times 5.58 \times \frac{1}{2} \times 9.51 = 75,353$

$2840 \times 4.95 \times \frac{1}{2} \times 6.00 = 42,194$

Restrain $M_o = 117,527$ #'

$F/S = \frac{117527}{25,950} = 4.5$ ok



Ramp @ Robert E. Lee & LaVea. (Approx. Sta. 120+30 E B/L.)

STATE OF LOUISIANA
CHARLES L. SLOAN
REG. No. 5597
REGISTERED
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING

ROUTING OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE FOR APPROVAL

(Used to route ENG Form 4025 with items attached. Not to become a part of the Contractor's record.)

	TO:	FROM:	DATE
1	C/Const Div	A/E, New Orleans	9/13/94

The attached items listed on ENG Form 4025 are forwarded for approval action.

CONTRACT NUMBER	CONTRACTOR
94-C-0079	B+K Const. Inc.
TRANSMITTAL NUMBERS	**PROJECT TITLE AND LOCATION**
Item # 13 (Sheet pile shop dwgs)	London Ave Flwl - Mirabeau to Leon C. Simon.

COMMENTS (Attach additional sheet, if necessary.)

Request your office review the attached alternate sheet pile shop drawings & layout submittal for subject contract & furnish NOA0 any comments by COB 23 Sept 94.

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
1	Dennis Duhon, Supv C,v Engr	

	TO:	FROM:	DATE
2	C/Engr Div	C/Const Div	9/16/94

COMMENTS (Attach additional sheet, if necessary.)

Request you review the attached and forward Cmts by ~~COB~~ 23 Sep 94

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
	RICHARD T. HILL,	Richard T. Hill

	TO:	FROM:	DATE
3	C/Const Div	C/Engr Div	10/4/94

COMMENTS (Attach additional sheet, if necessary.)

Not recommended for approval. See attached comments.

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
2	W. Eugene Tickner C/Engr Div	

	TO:	FROM:	DATE
4			

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D - WILL BE RETURNED BY SEPARATE CORRESPONDENCE.

E - DISAPPROVED (SEE ATTACHED)

F - RECEIPT ACKNOWLEDGED

G - OTHER (Specify)

ACTION CODES TO BE INSERTED IN COLUMN G, SECTION I, ENG FORM 4025 (Attach sheets, when required.)

ITEM NO. (Taken from ENG Form 4025)								
CODE GIVEN								

REMARKS

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE

Sheet Pile Submittal

1. Fabricated Sections.

a. Fabricated sections must be bolted in lieu of welded. Note 4, dwg. 18 and section C5B of the specifications requires fabricated sections be bolted using 7/8" ASTM A 325, Type 1 high strength bolts.

b. Additionally the 4" legs on the fabricated sections appear too small to be bolted. From our past experience, legs of fabricated sections should be a minimum of 6" to allow for the smooth interlocking without bolt head interference.

c. Note 5, dwg. 18 requires all bent plates have 1/2" minimum thickness.

d. Dwg. 22, Detail 1 requires a minimum angle of 3-1/2 x 3-1/2 x 3/8 for fabricated sections.

2. Tie-In Monoliths.

a. Casteel's dwgs. 1, 2, and 5 show sheet pile tie-ins to existing MP-112 shapes and specify tie-ins to existing MP-115. MP-112 and MP-115 vary greatly in configuration. Upon a field visit, we confirmed that the tie-ins will be made to existing MP-115 sheet piling. This should be field verified and the dwgs. should be changed to reflect the correct configuration of the MP-115. This may change details at the tie-ins.

b. Casteel's dwg. 3 of 5 shows sheet pile tie-ins to existing PZ-27. Upon a field visit, we discovered that these sheet piling are stamped Frodingham 3NA. This should be field verified and the dwgs. should be changed to reflect the correct piling. This may change details at the tie-in.

c. Casteel's dwg. 4 of 5 shows sheet pile tie-ins to existing MP-112 shapes and specify tie-ins to existing MP-115. MP-112 and MP-115 vary greatly in configuration. From a field visit, it appears that the piles are MP-112. This should be field verified and the dwgs. should be changed to reflect the correct piling.

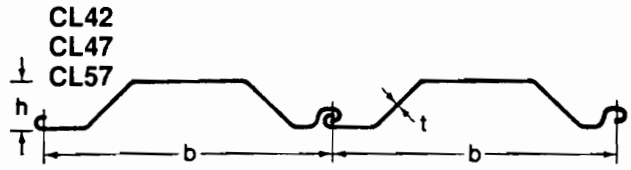
3. Offsets.

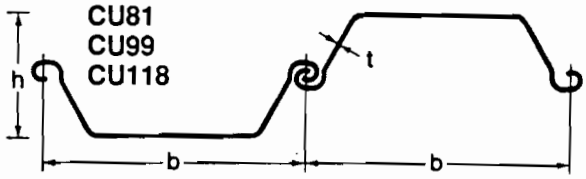
a. Note 1, dwg 18 requires a minimum of 6" concrete cover over sheet piling at all points. At the tie-in monoliths, sheet pile does not appear to have the required 6" of cover.

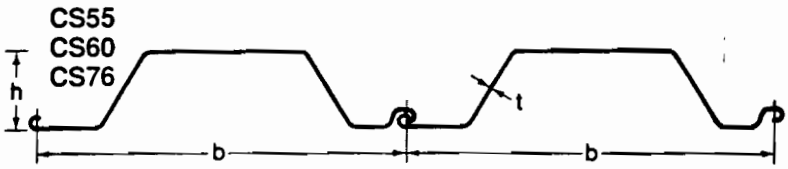
b. The submitted sheet pile alignment increases the wall offset in some areas. If the final configuration increases the wall offsets (defined from the centerline of the sheet pile to the land side crown) shown in the contract plans, note that a

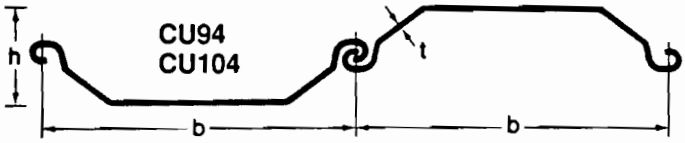
minimum 8' levee crown width must be maintained. Reference dwgs. 15, 16, and 17.

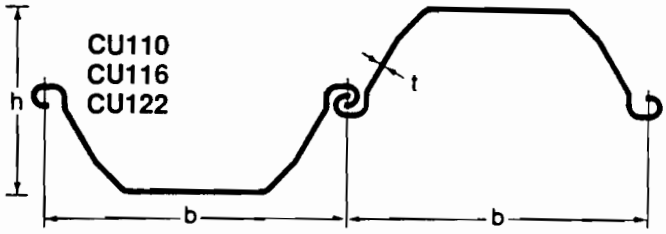
c. Casteel dwg. 5 of 5 shows a layout between Sta. 85+81.53 EB/L and Sta. 119+66.06 EB/L. This layout appears to be for the west baseline not the east baseline. Please clarify.









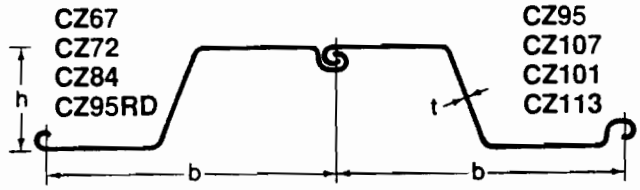


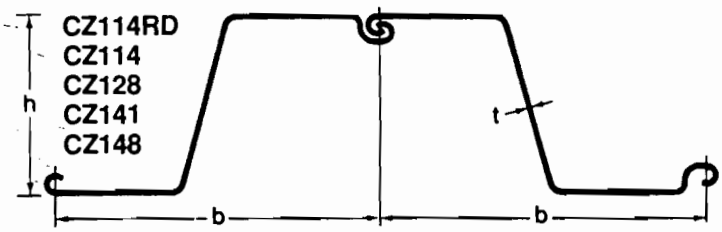
Casteel Sheet Piling Specifications

Sections	Width b	Height h	Thickness t(1)	Coating Area(2)	Sectional Area	Mass of pile	Mass of wall	Section Modulus	Moment of Inertia	Radius of Gyration	Sections
	in.	in.	in.	sq ft/ lin ft of pile	in^2/lin.ft.	lb./lin.ft.	lb./$ft.^2$	$in.^3$/lin.ft.	$in.^4$ lin.ft.	in.	
CL42	21.67	3.55	0.157	4.24	2.53	15.52	8.60	2.55	4.52	1.34	CL42
CL47	21.67	3.55	0.177	4.24	2.83	17.39	9.63	2.88	5.09	1.34	CL47
CL57	21.67	3.55	0.217	4.24	3.43	21.07	11.67	3.53	6.22	1.34	CL57
CS55	27.58	5.91	0.197	5.86	3.29	25.69	11.18	6.34	18.73	2.36	CS55
CS60	27.58	5.91	0.217	5.86	3.61	28.22	12.29	6.98	20.58	2.36	CS60
CS76	27.58	5.91	0.276	5.86	4.57	35.62	15.56	8.89	26.26	2.36	CS76
CU94	23.62	7.87	0.335	4.53	5.66	37.89	19.25	10.19	39.71	2.65	CU94
CU104	23.62	7.87	0.375	4.53	6.26	41.93	21.30	11.39	44.38	2.65	CU104
CU81	19.69	9.45	0.256	4.10	4.87	27.22	16.59	11.16	52.73	3.26	CU81
CU99	19.69	9.45	0.315	4.10	5.96	33.28	20.28	13.28	62.76	3.26	CU99
CU118	19.69	9.45	0.375	4.10	7.10	39.66	24.17	15.80	74.51	3.26	CU118
CU110	22.66	14.18	0.354	5.00	6.62	42.54	22.53	21.39	148.96	4.76	CU110
CU116	22.66	14.18	0.375	5.00	6.99	44.89	23.76	22.32	158.19	4.76	CU116
CU122	22.66	14.18	0.394	5.00	7.32	47.17	24.99	23.25	164.78	4.76	CU122

(1) Flanges and webs of the steel piles have the same thickness.
(2) Factor for estimating sq. ft. of sheet piling surface area to be coated per lin. ft. of pile; excludes interior surface of interlocks.
NOTE: Drawings, specifications and data have been taken from manufacturers' specifications.

- All piling sections can be produced in the following steel quality: ASTM A 328, ASTM A 572 Grade 50, ASTM A 690.
- Piling corners and special connectors supplied on request.
- For special built-up sections, box piles, etc. contact your CASTEEL USA, Inc. representative.
- All Casteel sheet piling is manufactured in the USA and meets or exceeds all "Buy American" specifications for steel sheet piling.





Casteel Sheet Piling Specifications

Sections	Width b	Height h	Thickness t (1)	Coating Area (2)	Sectional Area	Mass of pile	Mass of wall	Section Modulus	Moment of Inertia	Radius of Gyration	Sections
	in.	in.	in.	sq. ft./ lin. ft. of pile	$in.^2$/lin.ft.	lb./lin.ft.	lb./$ft.^2$	$in.^3$/lin.ft.	$in.^4$ lin.ft.	in.	
CZ67	21.65	7.88	0.217	4.78	4.03	24.76	13.72	10.69	42.11	3.23	CZ67
CZ72	21.65	7.88	0.236	4.78	4.36	26.70	14.83	11.68	46.00	3.27	CZ72
CZ84	21.65	7.88	0.276	4.78	5.05	31.05	17.21	13.62	53.63	3.27	CZ84
CZ95RD	21.65	7.88	0.308	4.78	5.58	34.28	19.00	15.16	59.73	3.27	CZ95RD
CZ95	21.65	7.88	0.315	4.78	5.72	35.15	19.46	15.53	61.15	3.27	CZ95
CZ101	21.65	7.88	0.335	4.78	6.08	37.37	20.70	16.50	65.01	3.27	CZ101
CZ107	21.65	7.88	0.354	4.78	6.44	39.58	21.91	17.48	68.84	3.27	CZ107
CZ113	21.65	7.88	0.375	4.78	6.80	41.70	23.10	18.40	72.70	3.27	CZ113
CZ114RD	24.02	13.39	0.315	5.90	6.43	43.80	21.88	29.76	199.24	5.55	CZ114RD
CZ114	24.02	13.39	0.335	5.90	6.88	46.83	23.40	31.62	211.60	5.55	CZ114
CZ128	24.02	13.39	0.375	5.90	7.68	52.28	26.22	35.34	236.50	5.55	CZ128
CZ141	24.02	13.39	0.413	5.90	8.48	57.92	28.88	39.06	261.40	5.55	CZ141
CZ148	24.02	13.39	0.433	5.90	8.88	60.68	30.31	40.92	273.90	5.55	CZ148

(1) Flanges and webs of the steel piles have the same thickness.
(2) Factor for estimating sq. ft. of sheet piling surface area to be coated per lin. ft. of pile; excludes interior surface of interlocks.
NOTE: Drawings, specifications and data have been taken from manufacturers' specifications.
- All piling sections can be produced in the following steel quality: ASTM A 328, ASTM A 572 Grade 50, ASTM A 690.
- Piling corners and special connectors supplied on request.
- For special built-up sections, box piles, etc. contact your CASTEEL USA, Inc. representative.
- All Casteel sheet piling is manufactured in the USA and meets or exceeds all "Buy American" specifications for steel sheet piling.

Steel Qualities

	Minimum Ultimate Stress		Minimum Yield Stress		Minimum Elongation In 8 ins.
	PSI	MPa	PSI	MPa	%
ASTM 328	70000	485	38400	270	17
ASTM A572 Grade 50	65000	450	50000	345	18
ASTM A690	70000	485	50000	345	18

LIST OF MATERIAL

- ALL STEEL SHEET PILING SHALL BE AS MANUFACTURED BY THE CASTEEL GROUP INC.
- STEEL QUALITY : TO MEET ASTM A572 GR.50
- THIS PROPOSAL & LAYOUT IS SUBJECT TO CUSTOMER REVIEW & ACCEPTANCE.
- ~~ALL WELDING TO BE DONE AS PER ANSI/AWS D.1.1-92 FOR STATICALLY BADED STRUCTURES.~~

PIECES No:	TYPE CZ101	QTY	LENGTH (FT)*	AREA (ft2)	NOTE
1 & 788	CU94	2	21.75	85.62	
2 & 787	CZ101-B3-90°	2	21.75	78.48	
3	CZ101 FABR. 90° CORNER	1	21.75	78.48	REQ. 2 PCS TO FAB.
4 TO 785	CZ101	782	21.75	30686.17	
786	CZ101 FABR. 90° CORNER	1	21.75	39.24	
TOTAL PCS CU94 REQ.		2			
TOTAL PCS CZ101-B3. REQ.		2			
TOTAL PCS CZ101 REQ.		785		TOTAL AREA (ft2) : 30967.99	
TOTAL PCS REQ.		789		TOTAL WEIGHT : 320.66 TONS	

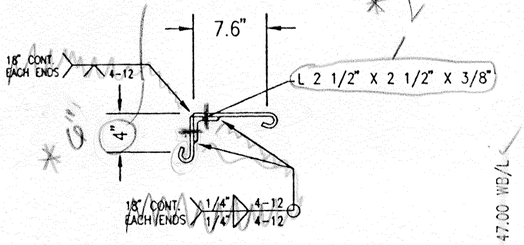
* IF ADD. CUT OFF IS REQ'D, CONTRACTOR MAY ORDER LONGER LENGTHS THAN INDICATED.

GENERAL NOTES.

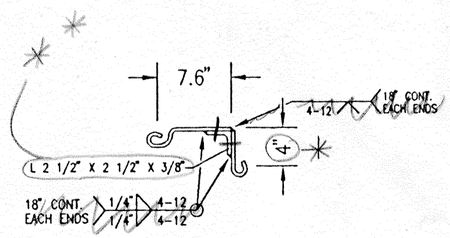
THEORITICAL WALL LENGTHS AND SOME STATIONS HAVE BEEN SLIGHTLY MODIFIED TO ACCOMODATE CASTEEL'S SECTIONS WIDTH. THESE VARIATIONS ON THE SHOP DRAWINGS ARE NOT SIGNIFICANT AND GENERALLY LESS THAN ONE FOOT.
USUAL DRIVING TOLERANCES FOR INTERLOCKED S.S.P. IS ±3% OF THEORITICAL WIDTH.
THEREFORE SOME FIELD ADJUSTMENTS ARE POSSIBLE AND MAY BE REQUIRED IF EXACT STATIONS LOCATIONS ARE TO BE MEET AT THE END OF A GIVEN WALL.

* Provide enough length for bolted connection

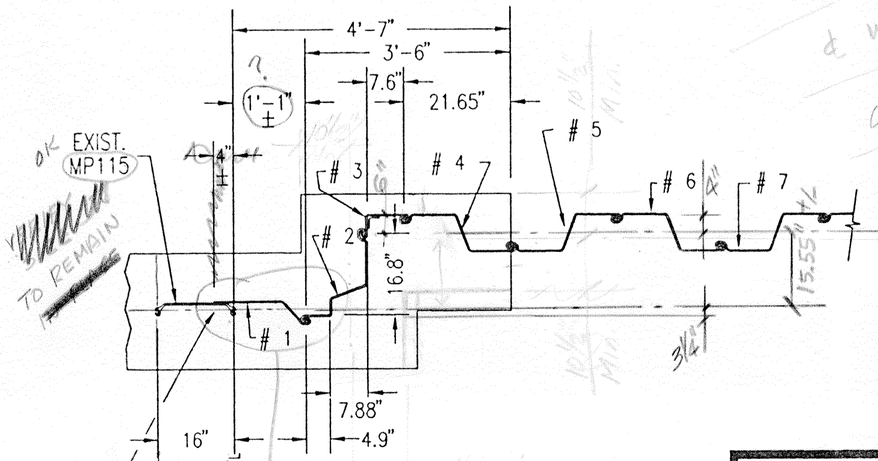
** L 3½x3½x3/8 (A36)

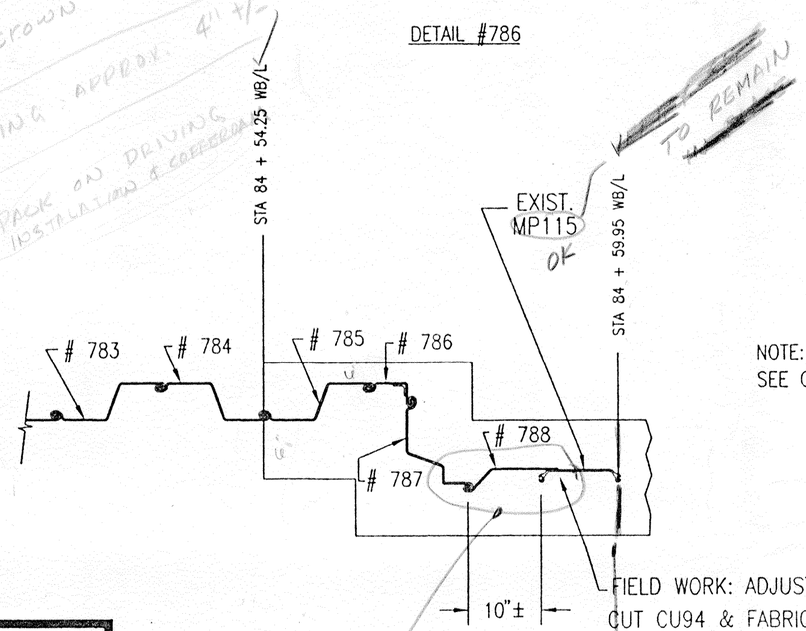


DETAIL #3



DETAIL #786





NOTE: FOR OTHERS DIM'S SEE OPOSITE SIDE

FIELD WORK: ADJUST DIMENSIONS IF REQ. CUT CU94 & FABRICATE TRANSITION PIECE WITH MP115

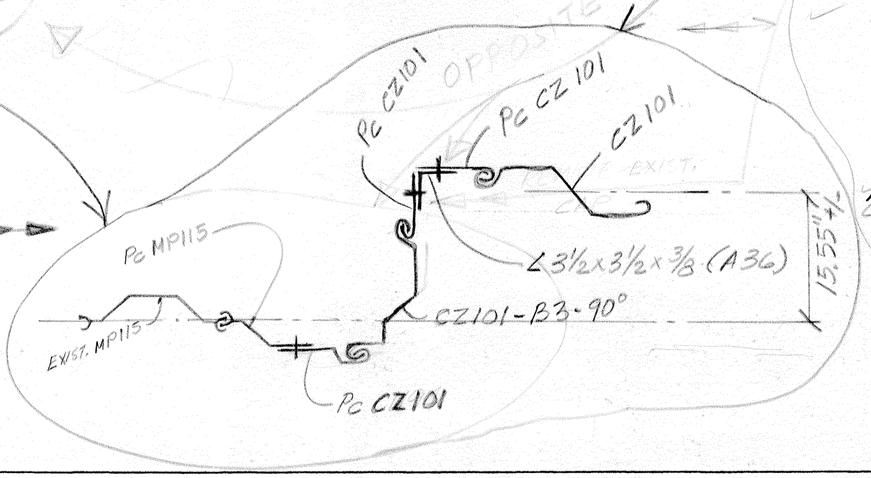
ALL SSP ITEM #1
TO ITEM #788
TOP ELEVATION 5.75'
BOTTOM ELEVATION -16.0'

FIELD WORK: ADJUST DIMENSIONS IF REQ. CUT CU94 & FABRICATE TRANSITION PIECE WITH MP115

REMOVE EXIST. CAP

REMOVE EXIST. CAP

OPP HAND TO



NOTE : (CASTEEL DWG. 01 THRU 05)

1. All fabricated connections shall be bolted using 7/8"ϕ High Strength, Type 1, see Sheet Pile Note #4 on dwg. 18.
2. All bent plates shall be ½" min., see Sheet Pile Note #5 on dwg. 18.

DO NOT POT ON SHOP DWG.

REVISION	DATE	REVISION	DATE
1		4	
2		5	
3		6	

NOTICE
CONFIDENTIAL PROPERTY OF THE CASTEEL GROUP INC.

THIRD ANGLE PROJECTION

THE CASTEEL GROUP inc

CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA
LONDON AVE. OUTFALL CANAL.
HURRICANE PROTECTION HIGH LEVEL PLAN
SKYLINE STEEL CORP.
B & K CONSTRUCTION

DATE AUG/12/94	CAD FILE No: CAST-007	SCALE 1/24
DRAWN J.ALMANRIC	CHECKED	SIZE "C"

CASTEEL DWG: 01 OF 05 — REV. 0

LIST OF MATERIAL

- ALL STEEL SHEET PILING SHALL BE AS MANUFACTURED BY THE CASTEEL GROUP INC.
- STEEL QUALITY : TO MEET ASTM A572 GR.50
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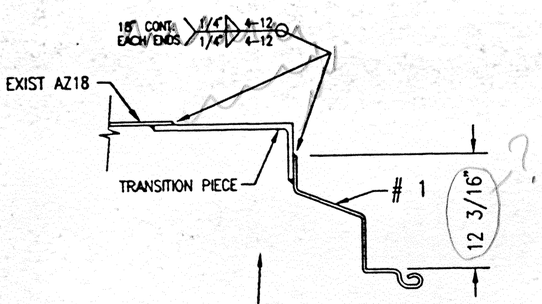
- ALL WELDING TO BE DONE AS PER ANSI/AWS D.1.1-92 FOR STATICALLY BADED STRUCTURES.

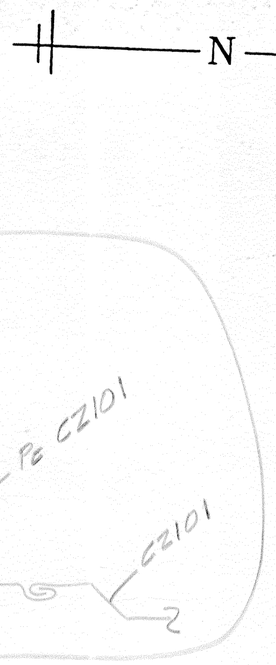
PIECES No:	TYPE	QTY	LENGTH (FT)*	AREA (ft2)	NOTE
1	CZ101-B2-90°	1	21.75	39.24	
2 TO 781	CZ101	780	21.75	30607.69	
782	CZ101-B3-90°	1	21.75	39.24	
783	CZ101	1	21.75	39.24	
784	CZ101	0	21.75	0.00	USE 1 MALE FLANGE CUT FROM PCE. #1
TOTAL PCS CZ101-B2. REQ.		1			
TOTAL PCS CZ101-B3. REQ.		1			
TOTAL PCS CZ101 REQ.		781		TOTAL AREA (ft2) : 30725.41	
TOTAL PCS REQ.		783		TOTAL WEIGHT : 318.21 TONS	

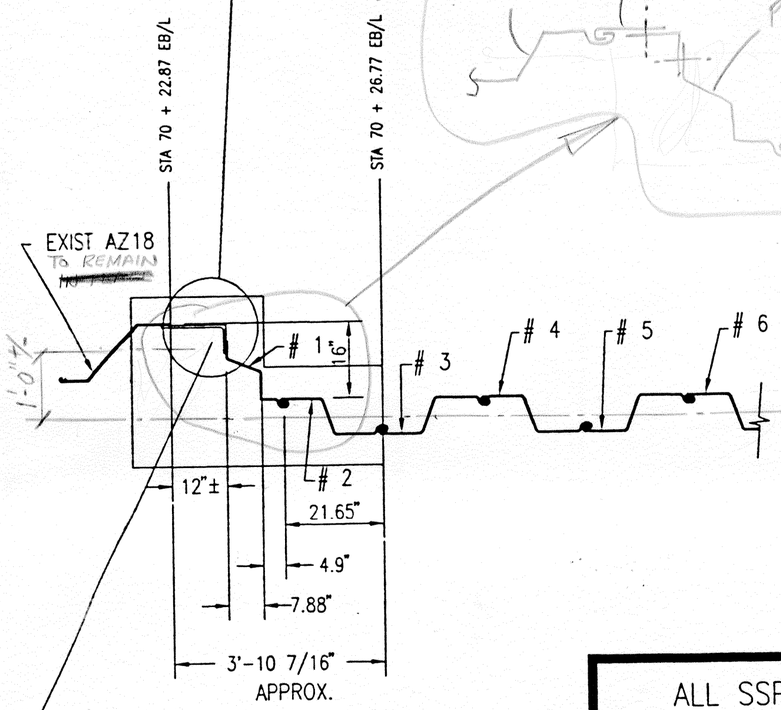
* IF ADD. CUT OFF IS REQ'D, CONTRACTOR MAY ORDER LONGER LENGTHS THAN INDICATED.

GENERAL NOTES.

THEORITICAL WALL LENGTHS AND SOME STATIONS HAVE BEEN SLIGHTLY MODIFIED TO ACCOMODATE CASTEEL'S SECTIONS WIDTH. THESE VARIATIONS ON THE SHOP DRAWINGS ARE NOT SIGNIFICANT AND GENERALLY LESS THAN ONE FOOT.
USUAL DRIVING TOLERANCES FOR INTERLOCKED S.S.P. IS ±3% OF THEORITICAL WIDTH.
THEREFORE SOME FIELD ADJUSTMENTS ARE POSSIBLE AND MAY BE REQUIRED IF EXACT STATIONS LOCATIONS ARE TO BE MEET AT THE END OF A GIVEN WALL.

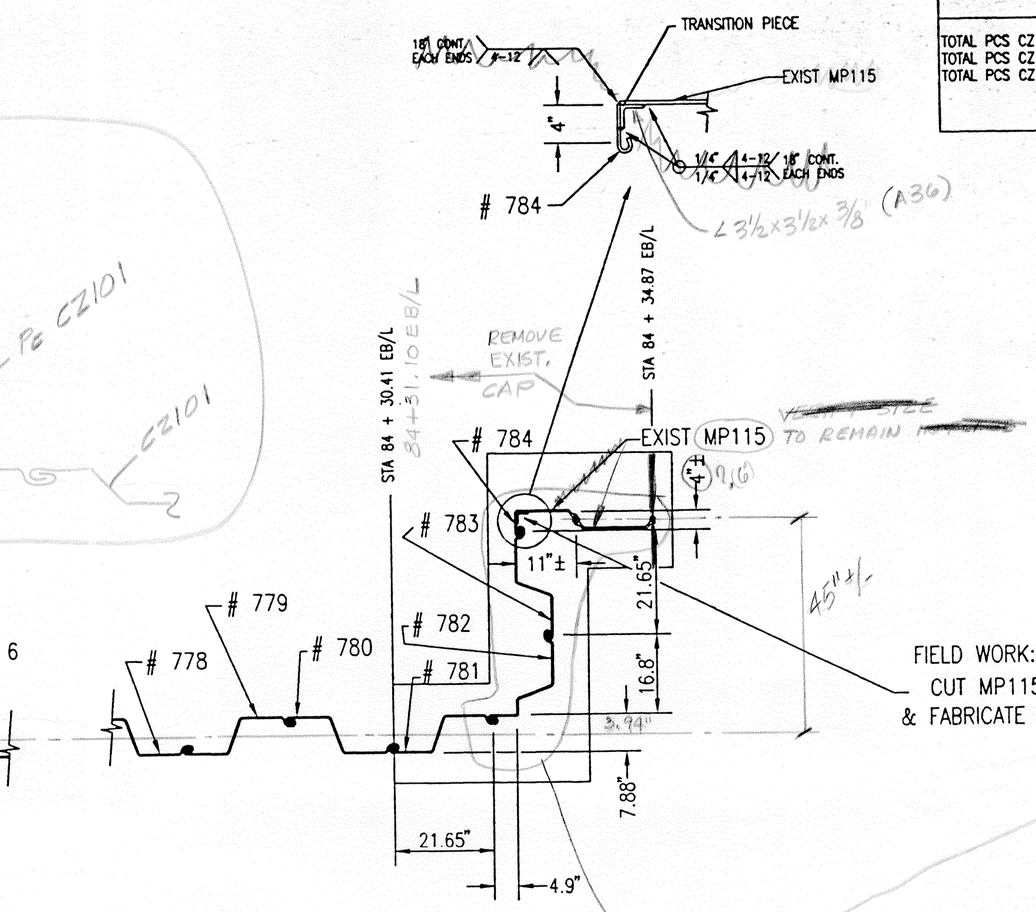




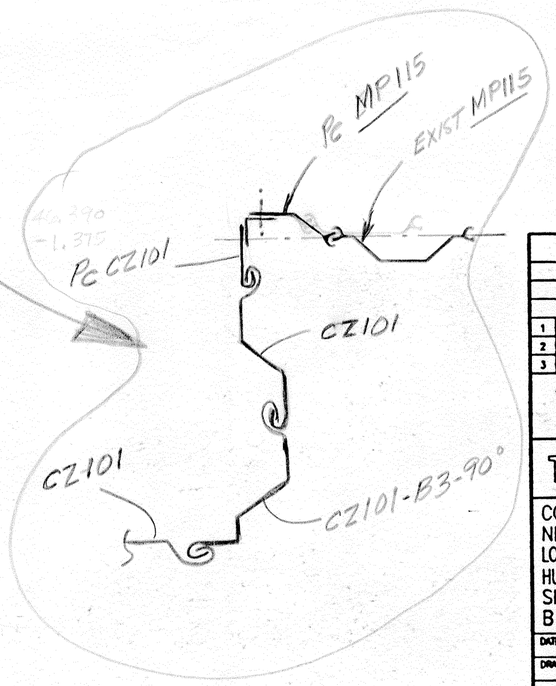


FIELD WORK: ADJUST DIMENSIONS IF REQ.
CUT AZ18 FLANGE & CZ101 CORNER
& FABRICATE TRANSITION PIECE WITH AZ18

ALL SSP ITEM #1
TO ITEM #784
TOP ELEVATION 5.75'
BOTTOM ELEVATION -16.0'



FIELD WORK: ADJUST DIMENSIONS IF REQ.
CUT MP115 FLANGE & CZ101 FLANGE
& FABRICATE TRANSITION PIECE WITH MP115



REVISION	DATE	REVISION	DATE
1		4	
2		5	
3		6	

THIRD ANGLE PROJECTION

NOTICE
CONFIDENTIAL PROPERTY OF THE CASTEEL GROUP INC.

THE CASTEEL GROUP inc

CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA
LONDON AVE. OUTFALL CANAL
HURRICANE PROTECTION HIGH LEVEL PLAN
SKYLINE STEEL CORP.
B & K CONSTRUCTION

DATE AUG/12/94	CAD FILE No: CAST-008	SCALE 1/24	
DRAWN J.ALMANRIC	CHECKED	SIZE "C"	
CASTEEL DWG: 02 OF 05		REV.	0

LIST OF MATERIAL

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PIECES No:	TYPE	QTY	LENGTH (FT)*	AREA (ft2)	NOTE
1	CZ101	1	24.75	44.65	
2	CZ101 FABR. 90° CORNER	1	24.75	44.65	USE 1 PCE. + 1 FEMALE FLANGE
3 TO 686	CZ101	684	24.75	30542.74	
687 TO 910	CZ101	224	26.75	10810.57	
911	CZ101 FABR. 90° CORNER	1	26.75	96.52	USE 1 PCE. + 1 MALE FLANGE
912	CZ101	1	26.75	48.26	
TOTAL PCS CZ101 REQ.		913			
				TOTAL AREA (ft2) : 41587.39	
TOTAL PCS REQ.		913		TOTAL WEIGHT : 430.70 TONS	

* IF ADD. CUT OFF IS REQ'D, CONTRACTOR MAY ORDER LONGER LENGTHS THAN INDICATED.

GENERAL NOTES.

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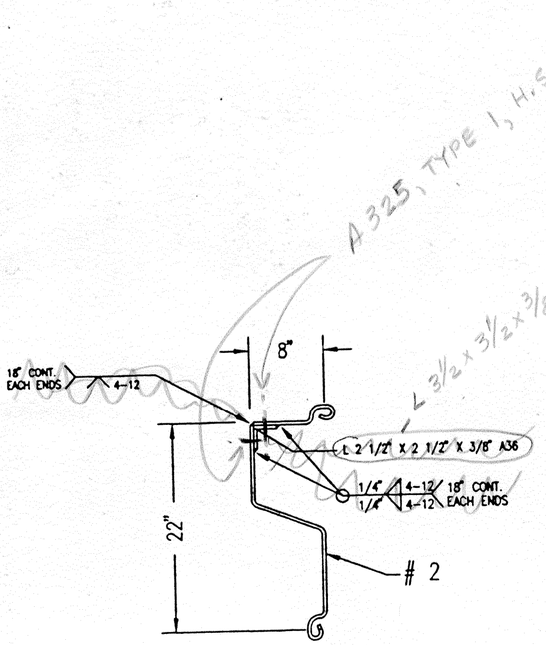

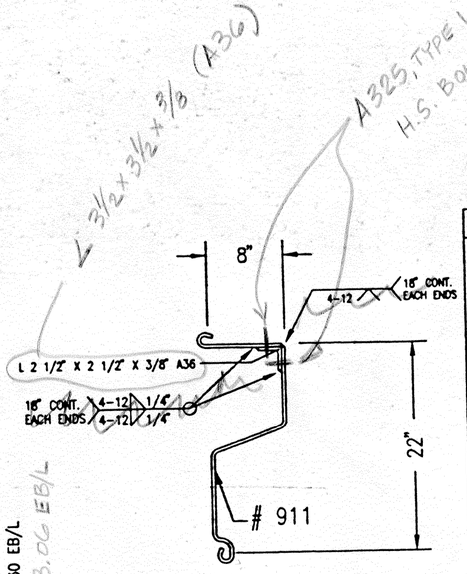

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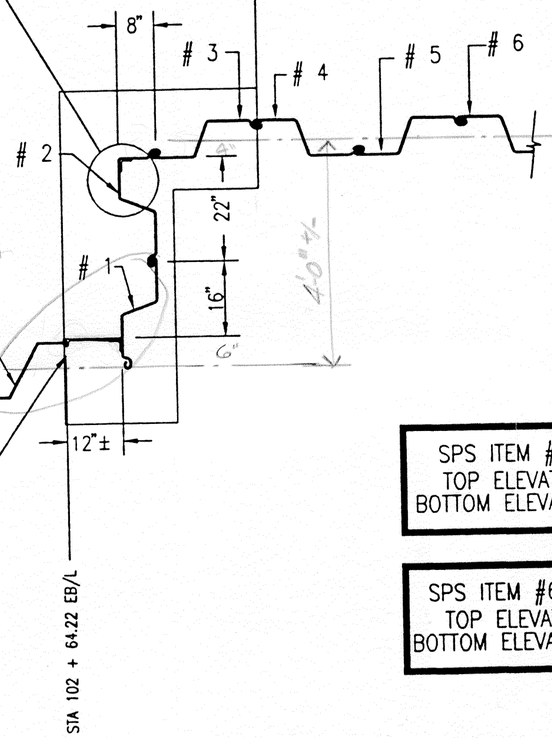
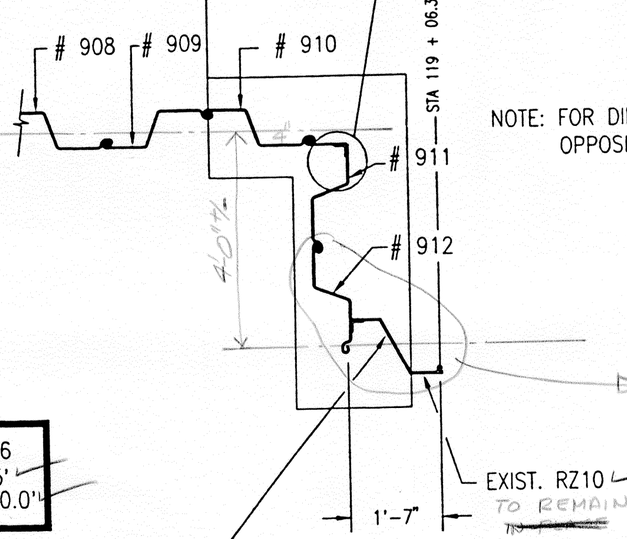
STA 102 + 67.72 EB/L

STA 119 + 02.30 EB/L

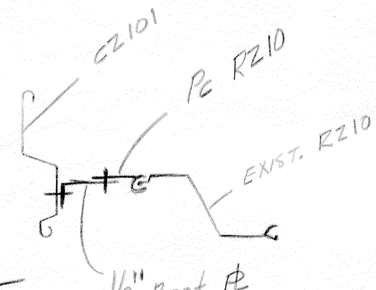
119+03.06 EB/L

STA 119 + 06.36 EB/L





NOTE: FOR DIM'S SEE OPPOSITE SIDE



SPS ITEM #1 TO 686
TOP ELEVATION 4.75'
BOTTOM ELEVATION -20.0'

SPS ITEM #687 TO 912
TOP ELEVATION 4.75'
BOTTOM ELEVATION -22'-0

FIELD WORK: ADJUST DIMENSIONS IF REQ.
CUT PZ27 FLANGE AND FABRICATE
TEE WITH CZ101 PCE

FIELD WORK: ADJUST DIMS
IF REQ'D, CUT RZ10
FLANGE OFF AND FABRICATE
TEE WITH CZ101 PC.

INGENIEUR - ENGINEER
DENIS GUIMOND
3478
ENGINEER

THIRD ANGLE PROJECTION

REVISION	DATE		REVISION	DATE
1		4		
2		5		
3		6		

NOTICE
CONFIDENTIAL PROPERTY OF THE CASTEEL GROUP INC.

THE CASTEEL GROUP inc

CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA
LONDON AVE. OUTFALL CANAL
HURRICANE PROTECTION HIGH LEVEL PLAN
SKYLINE STEEL CORP.
B & K CONSTRUCTION

DATE AUG/12/94	CAD FILE No: CAST-009	SCALE 1/24	
DRAWN J.ALMANRIC	CHECKED	SIZE "C"	
CASTEEL DWG: 03 OF 05		REV.	0

LIST OF MATERIAL

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PIECES No:	TYPE	QTY	LENGTH (FT)*	AREA (ft2)	NOTE
1 TO 348	CZ101	348	20.25	12713.96	
TOTAL PCS CZ101 REQ.		348	TOTAL AREA (ft2) : 12713.96		
TOTAL PCS REQ.		348	TOTAL WEIGHT : 131.67 TONS		

* IF ADD. CUT OFF IS REQ'D, CONTRACTOR MAY ORDER LONGER LENGTHS THAN INDICATED.

GENERAL NOTES.

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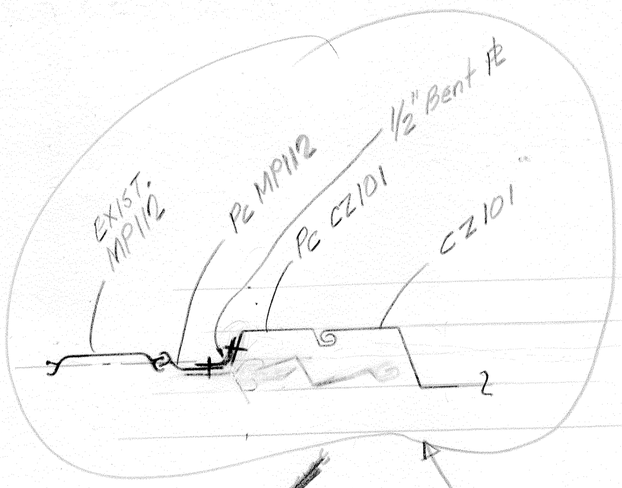

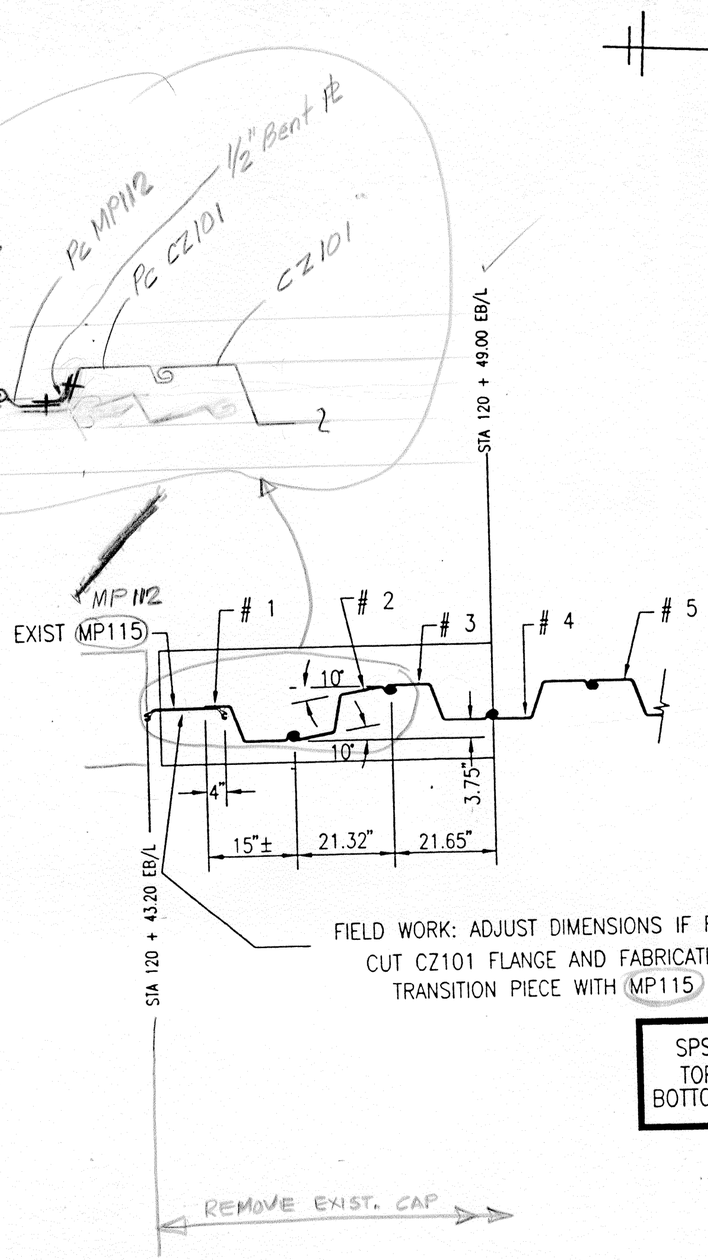

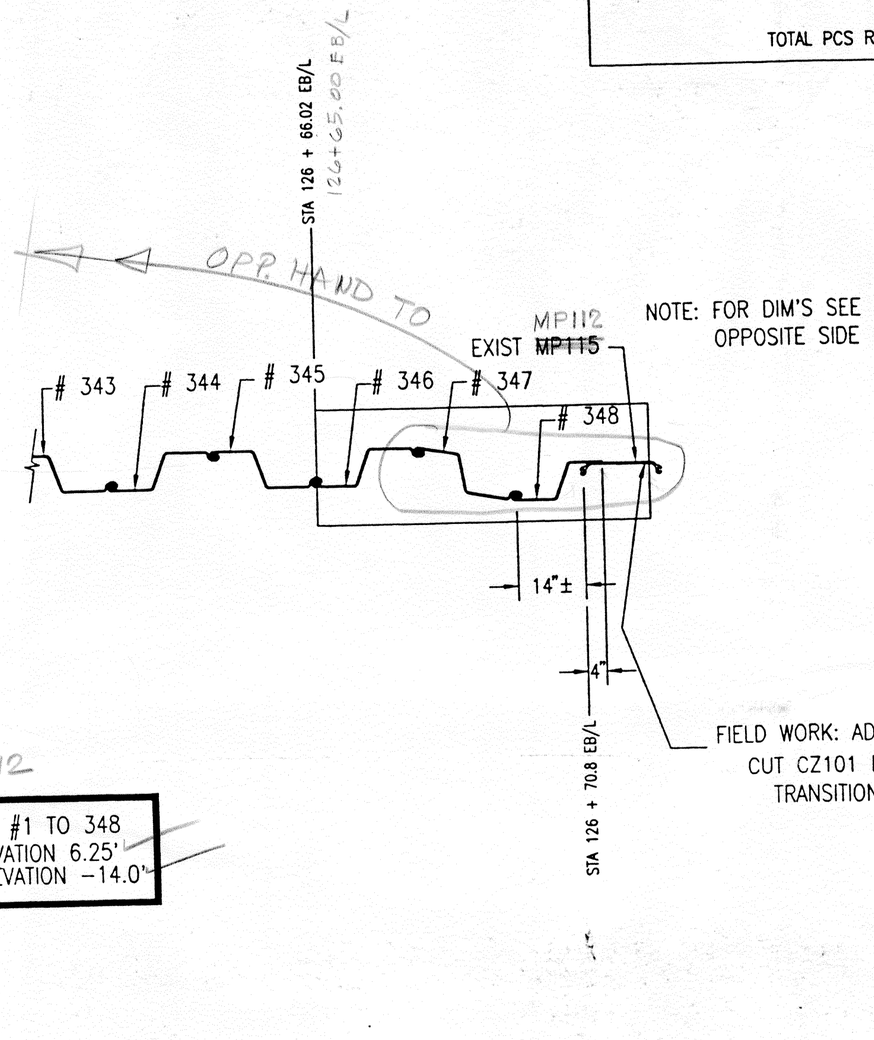

NOTE: FOR DIM'S SEE OPPOSITE SIDE

THIRD ANGLE PROJECTION

REVISION	DATE	REVISION	DATE
1		4	
2		5	
3		6	

NOTICE
CONFIDENTIAL PROPERTY OF THE CASTEEL GROUP INC.

THE CASTEEL GROUP inc

CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA
LONDON AVE. OUTFALL CANAL
HURRICANE PROTECTION HIGH LEVEL PLAN
SKYLINE STEEL CORP.
B & K CONSTRUCTION

DATE AUG/12/94	CAD FILE No: CAST-010	SCALE 1/24
DRAWN J.ALMANRIC	CHECKED	SIZE "C"

CASTEEL DWG: 04 OF 05 | REV. 0

NOTE THIS DRAWING ONLY
SOS ALL EB/L ON WB/L

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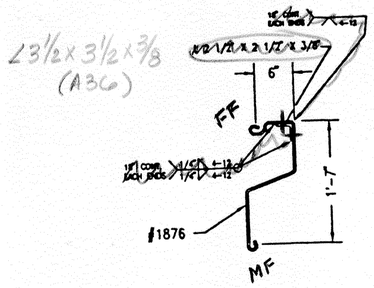
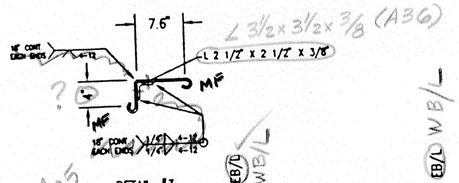
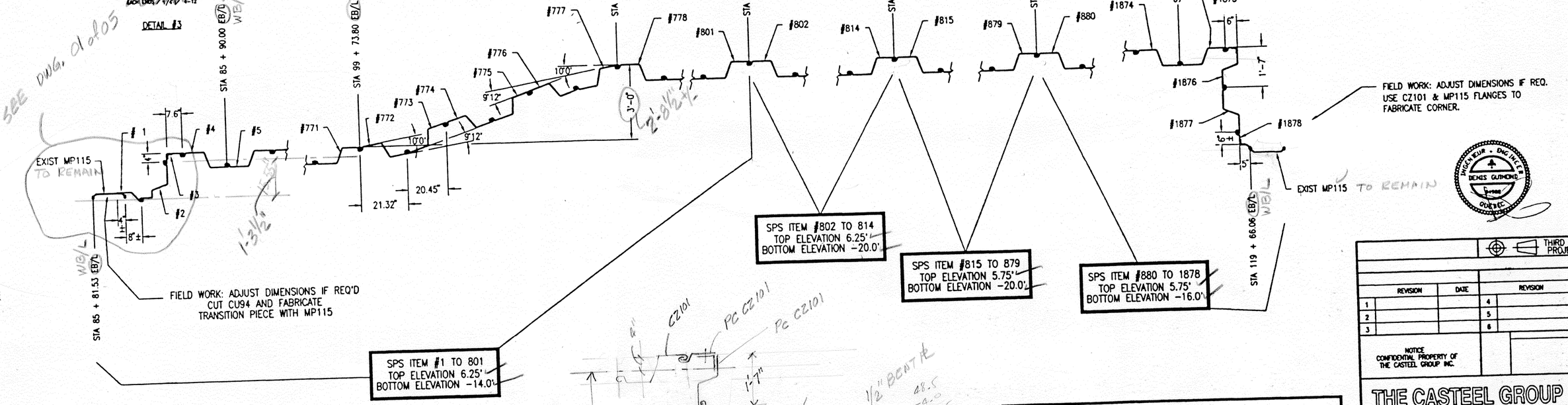
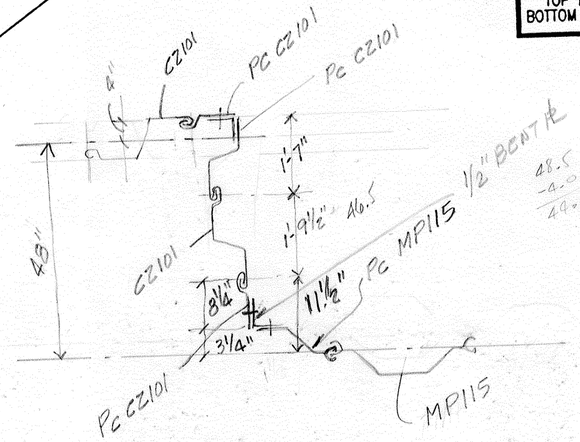
PIECES No:	TYPE	QTY	LENGTH (FT)*	AREA (ft2)	NOTE
1	CU94 ? CZ101	1	20.25	39.86	
2	CZ101-B3 (90°)	1	20.25	36.53	
3	CZ101	2	20.25	73.07	USE 2 MALE FLANGES FOR # 3 USE 2 FEMALE FLANGES ON #1876 & 1878
4 TO 801	CZ101	798	20.25	29154.43	
802 TO 814	CZ101	13	26.25	615.67	
815 TO 879	CZ101	65	25.75	3019.72	
880 TO 1875	CZ101	996	21.75	39083.66	
1876	CZ101	1	21.75	39.24	USE 1 FEMALE FLANGE FROM # 3
1877	CZ101	1	21.75	39.24	
1878	CZ101	0	21.75	0	USE 1 FEMALE FLANGE FROM # 3
TOTAL PCS CU94 REQ.		1			
TOTAL PCS CZ101 REQ.		1877		TOTAL AREA (ft2) : 72101.43	
TOTAL PCS REQ.		1878		TOTAL WEIGHT : 746.70 TONS	

* IF ADD. CUT OFF IS REQ'D, CONTRACTOR MAY ORDER LONGER LENGTHS THAN INDICATED.









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GENERAL NOTES.

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THIRD ANGLE PROJECTION

REVISION	DATE	REVISION	DATE
1		4	
2		5	
3		6	

NOTICE: CONFIDENTIAL PROPERTY OF THE CASTEEL GROUP INC.

THE CASTEEL GROUP inc

CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA
LONDON AVE. OUTFALL CANAL.
HURRICANE PROTECTION HIGH LEVEL PLAN
SKYLINE STEEL CORP.
B & K CONSTRUCTION

DATE AUG/12/94	CAD FILE No: CAST-011	SCALE 1/36	
DRAWN J.ALMANRIC	CHECKED	SIZE "C"	

CASTEEL DWG: 05 OF 05 | REV. 0

NOTE THIS DRAWING ONLY
SOS ALL EB/L ON WB/L

LIST OF MATERIAL

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3	CZ101	2	20.25	73.07	USE 2 MALE FLANGES FOR # 3 USE 2 FEMALE FLANGES ON #1876 & 1878
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802 TO 814	CZ101	13	26.25	615.67	
815 TO 879	CZ101	65	25.75	3019.72	
880 TO 1875	CZ101	996	21.75	39083.66	
1876	CZ101	1	21.75	39.24	USE 1 FEMALE FLANGE FROM # 3
1877	CZ101	1	21.75	39.24	
1878	CZ101	0	21.75	0	USE 1 FEMALE FLANGE FROM # 3
TOTAL PCS CU94 REQ.		1			
TOTAL PCS CZ101 REQ.		1877		TOTAL AREA (ft2) : 72101.43	
TOTAL PCS REQ.		1878		TOTAL WEIGHT : 746.70 TONS	

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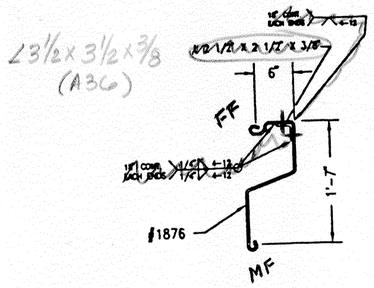

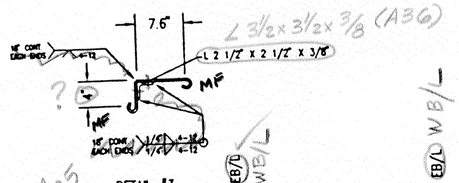

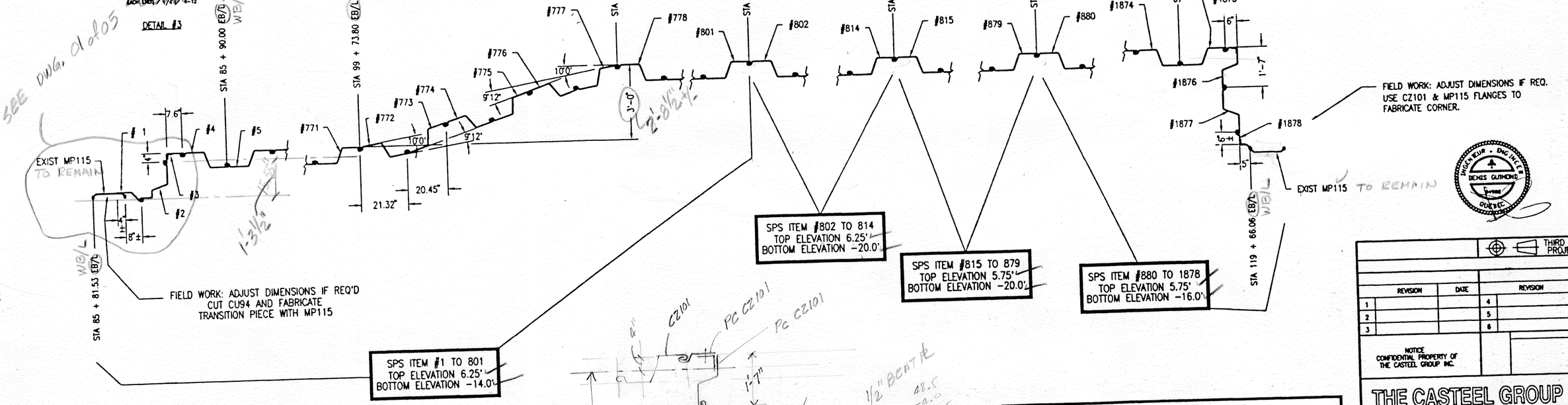

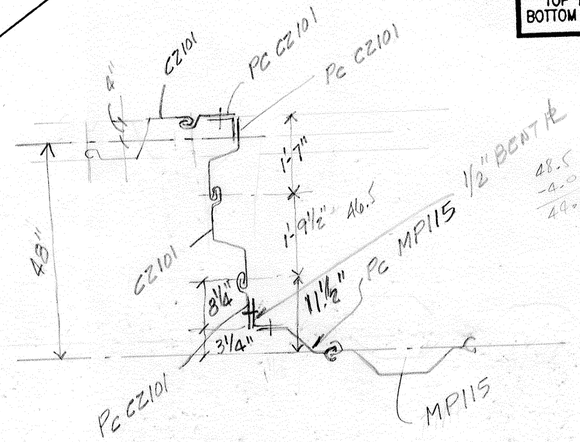

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THIRD ANGLE PROJECTION

REVISION	DATE	REVISION	DATE
1		4	
2		5	
3		6	

NOTICE: CONFIDENTIAL PROPERTY OF THE CASTEEL GROUP INC.

THE CASTEEL GROUP inc

CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA
LONDON AVE. OUTFALL CANAL.
HURRICANE PROTECTION HIGH LEVEL PLAN
SKYLINE STEEL CORP.
B & K CONSTRUCTION

DATE AUG/12/94	CAD FILE No: CAST-011	SCALE 1/36	
DRAWN J.ALMANRIC	CHECKED	SIZE "C"	

CASTEEL DWG: 05 OF 05 | REV. 0

NOTE THIS DRAWING ONLY
SOS ALL EB/L ON WB/L

LIST OF MATERIAL

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TOTAL PCS CU94 REQ.		1			
TOTAL PCS CZ101 REQ.		1877			
			TOTAL AREA (ft2) : 72101.43		
TOTAL PCS REQ.		1878	TOTAL WEIGHT : 746.70 TONS		

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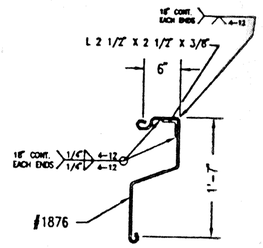

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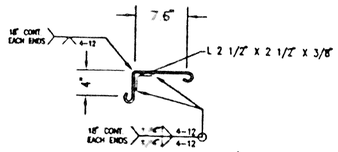
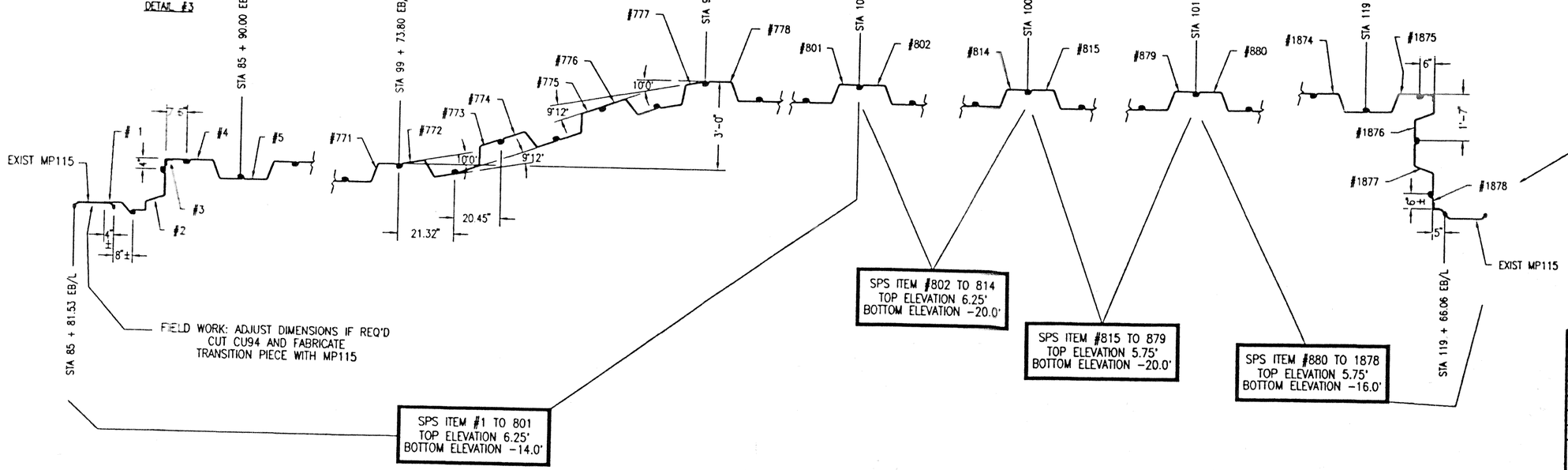


DETAIL #3



GENERAL NOTES.

THEORITICAL WALL LENGTHS AND SOME STATIONS HAVE BEEN SLIGHTLY MODIFIED TO ACCOMODATE CASTEEL'S SECTIONS WIDTH. THESE VARIATIONS ON THE SHOP DRAWINGS ARE NOT SIGNIFICANT AND GENERALLY LESS THAN ONE FOOT.
USUAL DRIVING TOLERANCES FOR INTERLOCKED S.S.P. IS ±3% OF THEORITICAL WIDTH.
THEREFORE SOME FIELD ADJUSTMENTS ARE POSSIBLE AND MAY BE REQUIRED IF EXACT STATIONS LOCATIONS ARE TO BE MEET AT THE END OF A GIVEN WALL.

INGÉNIEUR · ENGINEER
DENIS GUIMOND
QUÉBEC

THIRD ANGLE PROJECTION

REVISION	DATE	REVISION	DATE
1		4	
2		5	
3		6	

NOTICE
CONFIDENTIAL PROPERTY OF THE CASTEEL GROUP INC.

THE CASTEEL GROUP inc

CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA
LONDON AVE. OUTFALL CANAL.
HURRICANE PROTECTION HIGH LEVEL PLAN
SKYLINE STEEL CORP.
B & K CONSTRUCTION

DATE	AUG/12/94	CAD FILE No:	CAST-011	SCALE	1/36
DRAWN	J.ALMANRIC	CHECKED		SIZE	"C"

CASTEEL DWG: 05 OF 05 | REV. 0

LIST OF MATERIAL

- ALL STEEL SHEET PILING SHALL BE AS MANUFACTURED BY THE CASTEEL GROUP INC.
- STEEL QUALITY : TO MEET ASTM A572 GR.50
- THIS PROPOSAL & LAYOUT IS SUBJECT TO CUSTOMER REVIEW & ACCEPTANCE.
- ALL WELDING TO BE DONE AS PER ANSI/AWS D.1.1-92 FOR STATICALLY BADED STRUCTURES.

PIECES No:	TYPE	QTY	LENGTH (FT)*	AREA (ft2)	NOTE
1 & 788	CU94	2	21.75	85.62	
2 & 787	CZ101-B3-90°	2	21.75	78.48	
3	CZ101 FABR. 90° CORNER	1	21.75	78.48	REQ. 2 PCS TO FAB.
4 TO 785	CZ101	782	21.75	30686.17	
786	CZ101 FABR. 90° CORNER	1	21.75	39.24	
TOTAL PCS CU94 REQ.		2			
TOTAL PCS CZ101-B3. REQ.		2			
TOTAL PCS CZ101 REQ.		785			
			TOTAL AREA (ft2) : 30967.99		
TOTAL PCS REQ.		789	TOTAL WEIGHT : 320.66 TONS		

* IF ADD. CUT OFF IS REQ'D, CONTRACTOR MAY ORDER LONGER LENGTHS THAN INDICATED.

GENERAL NOTES.

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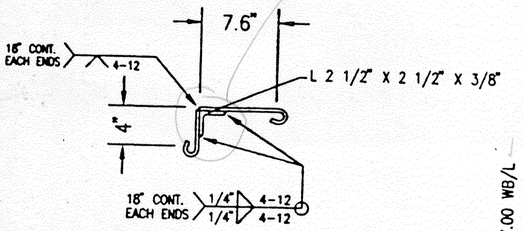
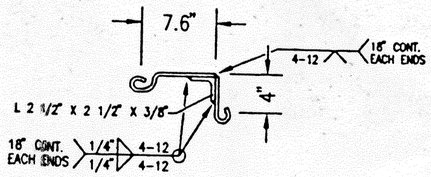
THEREFORE SOME FIELD ADJUSTMENTS ARE POSSIBLE AND MAY BE REQUIRED IF EXACT STATIONS LOCATIONS ARE TO BE MEET AT THE END OF A GIVEN WALL.

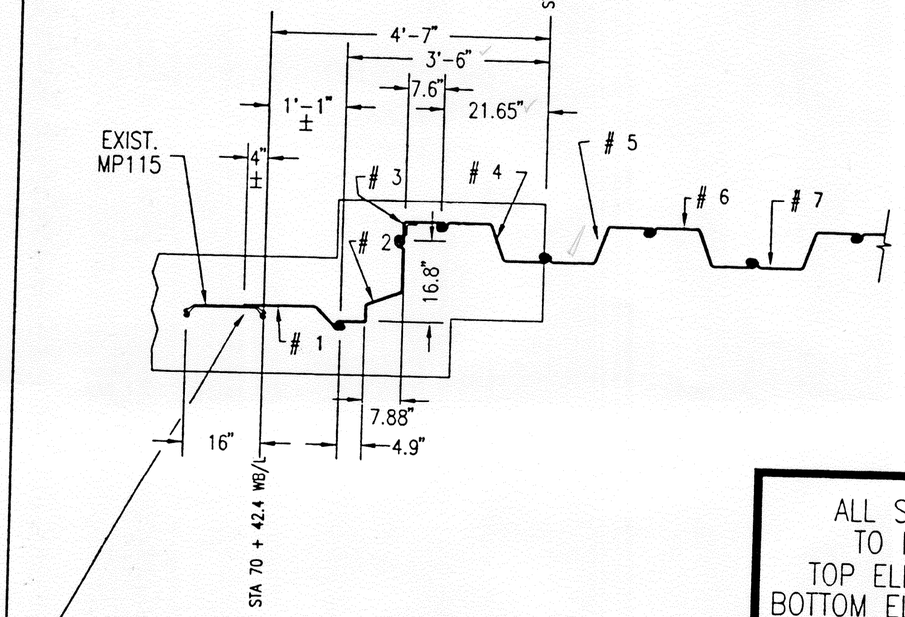
N



DETAIL #3

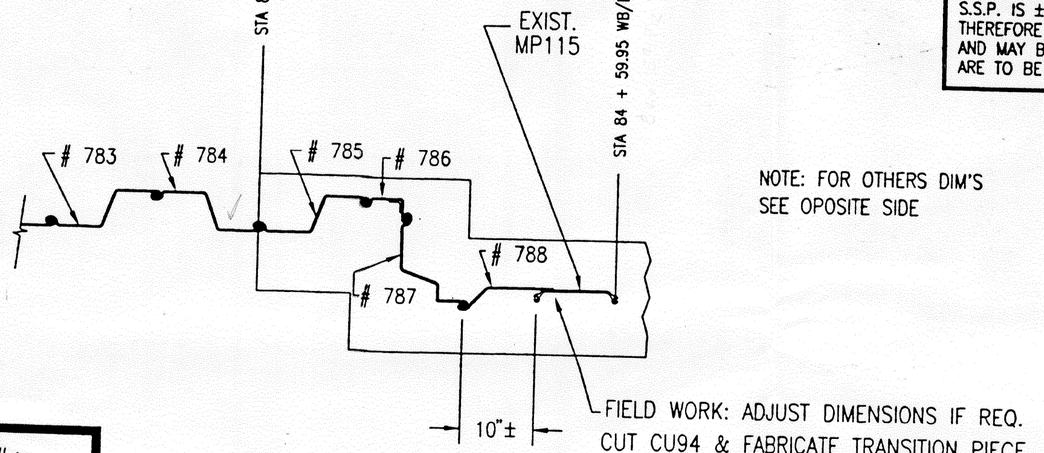


DETAIL #786



FIELD WORK: ADJUST DIMENSIONS IF REQ. CUT CU94 & FABRICATE TRANSITION PIECE WITH MP115

ALL SSP ITEM #1
TO ITEM #788
TOP ELEVATION 5.75'
BOTTOM ELEVATION -16.0'



FIELD WORK: ADJUST DIMENSIONS IF REQ. CUT CU94 & FABRICATE TRANSITION PIECE WITH MP115

NOTE: FOR OTHERS DIM'S SEE OPOSITE SIDE

DENIS GUIMOND

THIRD ANGLE PROJECTION

REVISION	DATE	REVISION	DATE
1		4	
2		5	
3		6	

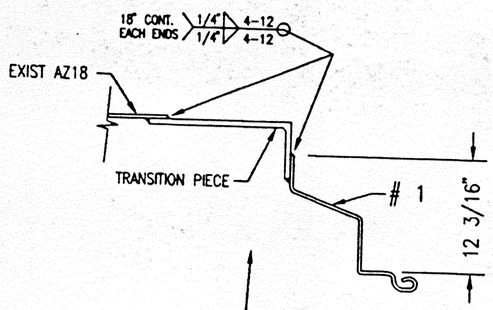
NOTICE
CONFIDENTIAL PROPERTY OF THE CASTEEL GROUP INC.

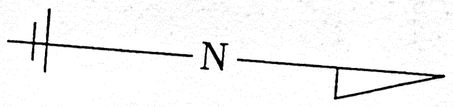
THE CASTEEL GROUP inc

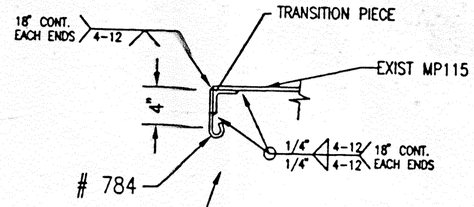
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA
LONDON AVE. OUTFALL CANAL
HURRICANE PROTECTION HIGH LEVEL PLAN
SKYLINE STEEL CORP.
B & K CONSTRUCTION

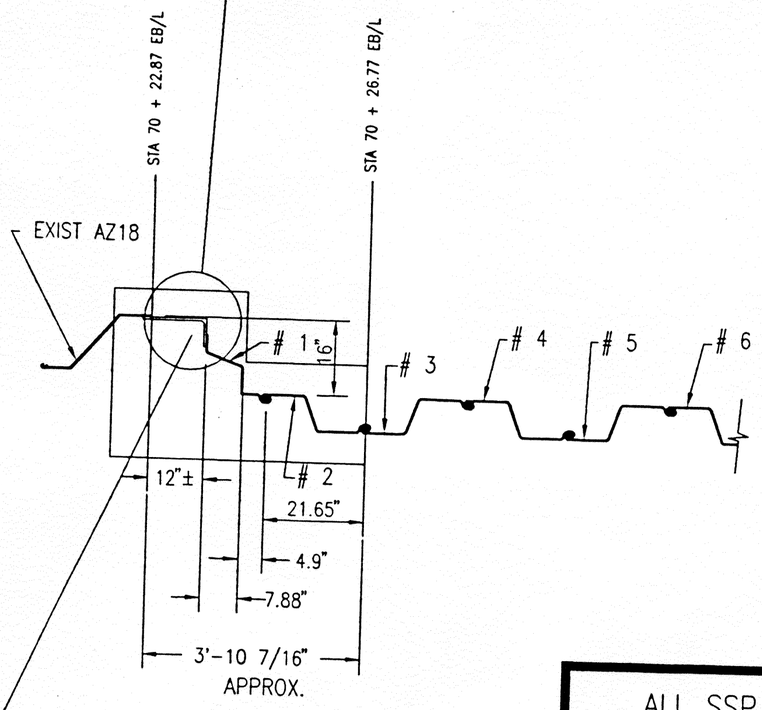
DATE	AUG/12/94	CAD FILE No:	CAST-007	SCALE	1/24
DRAWN	J.ALMANRIC	CHECKED		SIZE	"C"

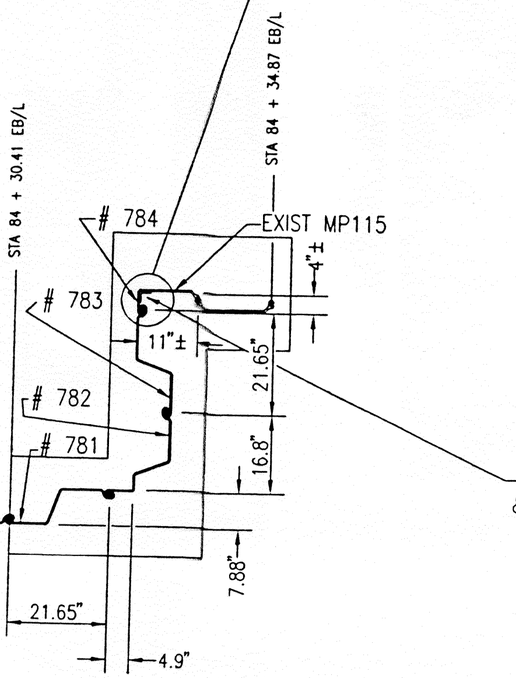
CASTEEL DWG: 01 OF 05 | REV. 0











FIELD WORK: ADJUST DIMENSIONS IF REQ.
CUT AZ18 FLANGE & CZ101 CORNER
& FABRICATE TRANSITION PIECE WITH AZ18

FIELD WORK: ADJUST DIMENSIONS IF REQ.
CUT MP115 FLANGE & CZ101 FLANGE
& FABRICATE TRANSITION PIECE WITH MP115

ALL SSP ITEM #1
TO ITEM #784
TOP ELEVATION 5.75'
BOTTOM ELEVATION -16.0'

LIST OF MATERIAL

- ALL STEEL SHEET PILING SHALL BE AS MANUFACTURED BY THE CASTEEL GROUP INC.
- STEEL QUALITY : TO MEET ASTM A572 GR.50
- THIS PROPOSAL & LAYOUT IS SUBJECT TO CUSTOMER REVIEW & ACCEPTANCE.
- ALL WELDING TO BE DONE AS PER ANSI/AWS D.1.1-92 FOR STATICALLY BADED STRUCTURES.

PIECES No:	TYPE	QTY	LENGTH (FT)*	AREA (ft2)	NOTE
1	CZ101-B2-90°	1	21.75	39.24	
2 TO 781	CZ101	780	21.75	30607.69	
782	CZ101-B3-90°	1	21.75	39.24	
783	CZ101	1	21.75	39.24	
784	CZ101	0	21.75	0.00	USE 1 MALE FLANGE CUT FROM PCE. #1
TOTAL PCS CZ101-B2. REQ.		1			
TOTAL PCS CZ101-B3. REQ.		1			
TOTAL PCS CZ101 REQ.		781		TOTAL AREA (ft2) : 30725.41	
TOTAL PCS REQ.		783		TOTAL WEIGHT : 318.21 TONS	

* IF ADD. CUT OFF IS REQ'D, CONTRACTOR MAY ORDER LONGER LENGTHS THAN INDICATED.

GENERAL NOTES.

THEORITICAL WALL LENGTHS AND SOME STATIONS HAVE BEEN SLIGHTLY MODIFIED TO ACCOMODATE CASTEEL'S SECTIONS WIDTH. THESE VARIATIONS ON THE SHOP DRAWINGS ARE NOT SIGNIFICANT AND GENERALLY LESS THAN ONE FOOT.
USUAL DRIVING TOLERANCES FOR INTERLOCKED S.S.P. IS ±3% OF THEORITICAL WIDTH.
THEREFORE SOME FIELD ADJUSTMENTS ARE POSSIBLE AND MAY BE REQUIRED IF EXACT STATIONS LOCATIONS ARE TO BE MEET AT THE END OF A GIVEN WALL.

INGÉNIEUR · ENGINEER DENIS GUIMOND QUÉBEC

THIRD ANGLE PROJECTION

REVISION	DATE		REVISION	DATE
1		4		
2		5		
3		6		

NOTICE
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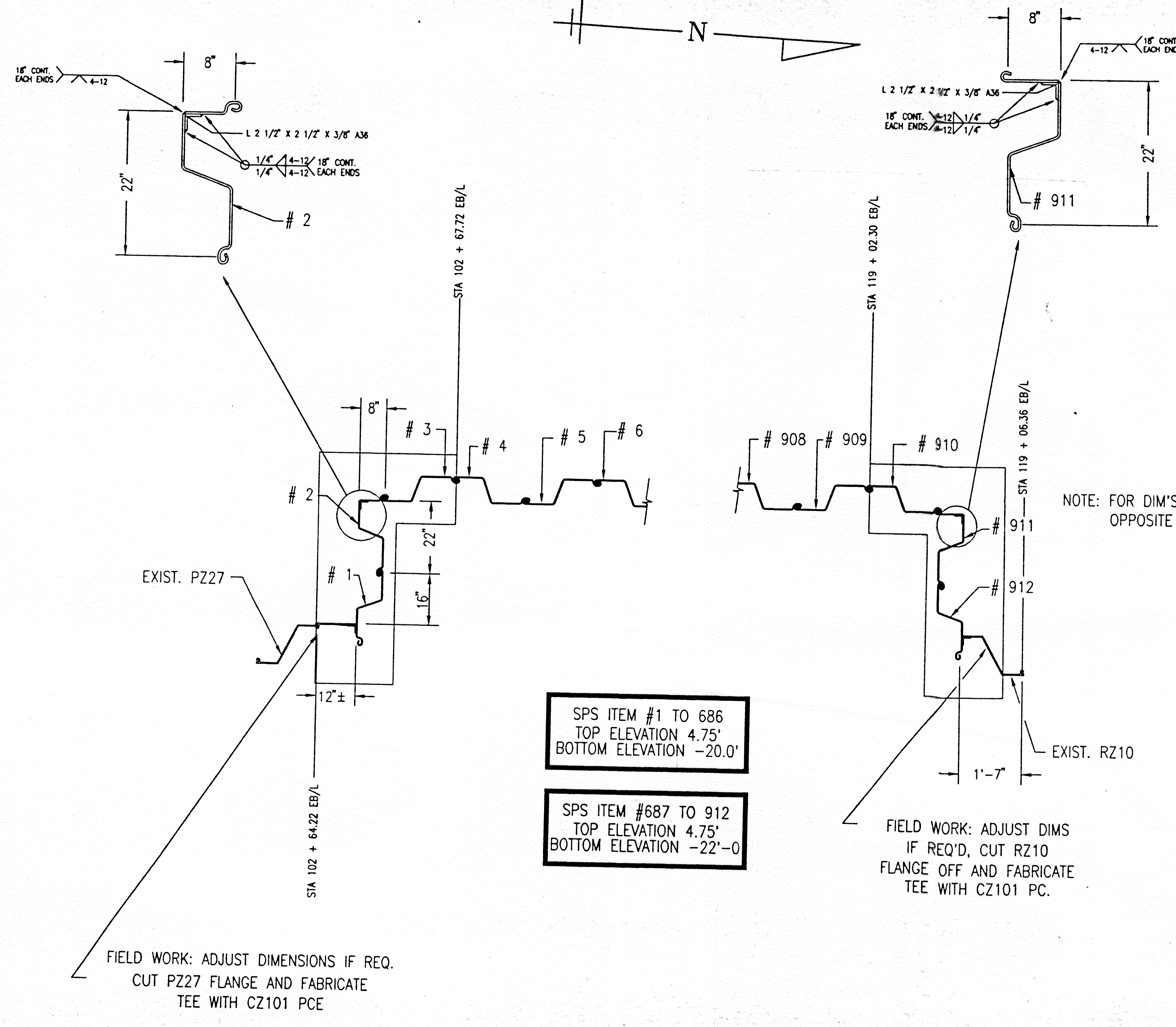
THE CASTEEL GROUP inc

CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA
LONDON AVE. OUTFALL CANAL
HURRICANE PROTECTION HIGH LEVEL PLAN
SKYLINE STEEL CORP.
B & K CONSTRUCTION

DATE	AUG/12/94	CAD FILE No:	CAST-008	SCALE	1/24
DRAWN	J.ALMANRIC	CHECKED		SIZE	"C"

CASTEEL DWG: 02 OF 05 | REV. 0



LIST OF MATERIAL

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PIECES No:	TYPE	QTY	LENGTH (FT)*	AREA (ft2)	NOTE
1	CZ101	1	24.75	44.65	
2	CZ101 FABR. 90° CORNER	1	24.75	44.65	USE 1 PCE. + 1 FEMALE FLANGE
3 TO 686	CZ101	684	24.75	30542.74	
687 TO 910	CZ101	224	26.75	10810.57	
911	CZ101 FABR. 90° CORNER	1	26.75	96.52	USE 1 PCE. + 1 MALE FLANGE
912	CZ101	1	26.75	48.26	
TOTAL PCS CZ101 REQ.		913			
	TOTAL PCS REQ.	913	TOTAL AREA (ft2) : 41587.39 TOTAL WEIGHT : 430.70 TONS		

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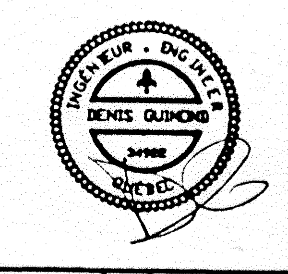

THIRD ANGLE PROJECTION

	REVISION	DATE		REVISION	DATE
1			4		
2			5		
3			6		

THE CASTEEL GROUP inc

CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA
LONDON AVE. OUTFALL CANAL
HURRICANE PROTECTION HIGH LEVEL PLAN
SKYLINE STEEL CORP.
B & K CONSTRUCTION

DATE AUG/12/94	CAD FILE No: CAST-009	SCALE 1/24
DRAWN J.ALMANRIC	CHECKED	SIZE "C"

CASTEEL DWG: 03 OF 05 — REV. 0

LIST OF MATERIAL

- ALL STEEL SHEET PILING SHALL BE AS MANUFACTURED BY THE CASTEEL GROUP INC.
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- ALL WELDING TO BE DONE AS PER ANSI/AWS D.1.1-92 FOR STATICALLY BADED STRUCTURES.

PIECES No:	TYPE	QTY	LENGTH (FT)*	AREA (ft2)	NOTE
1 TO 348	CZ101	348	20.25	12713.96	
TOTAL PCS CZ101 REQ.		348			
				TOTAL AREA (ft2) : 12713.96	
	TOTAL PCS REQ.	348		TOTAL WEIGHT : 131.67 TONS	

* IF ADD. CUT OFF IS REQ'D, CONTRACTOR MAY ORDER LONGER LENGTHS THAN INDICATED.

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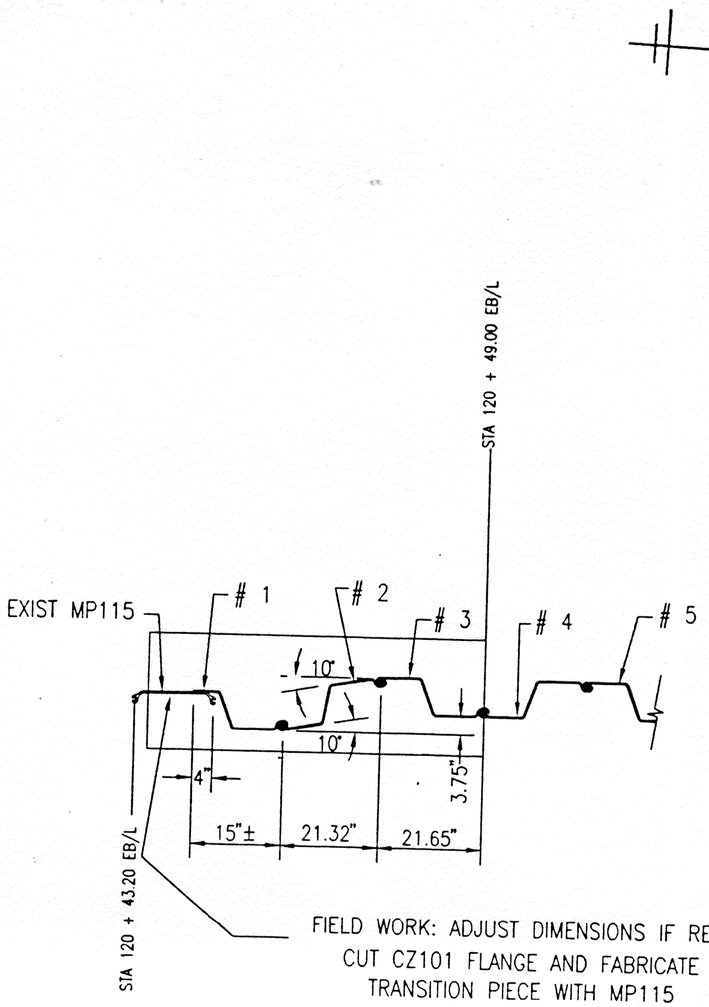
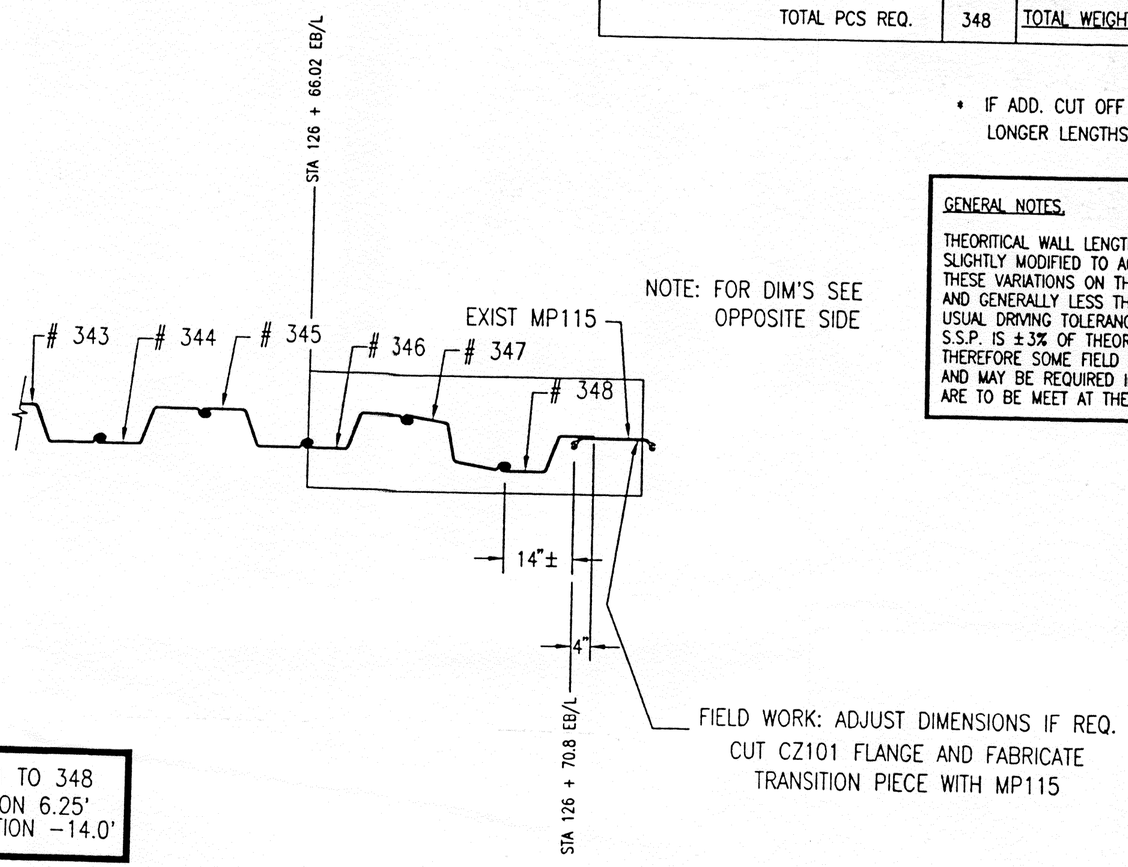


SPS ITEM #1 TO 348
TOP ELEVATION 6.25'
BOTTOM ELEVATION -14.0'

NOTE: FOR DIM'S SEE OPPOSITE SIDE



THIRD ANGLE PROJECTION

REVISION	DATE	REVISION	DATE
1		4	
2		5	
3		6	

THE CASTEEL GROUP Inc

CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA
LONDON AVE. OUTFALL CANAL
HURRICANE PROTECTION HIGH LEVEL PLAN
SKYLINE STEEL CORP.
B & K CONSTRUCTION

DATE	AUG/12/94	CAD FILE No:	CAST-010	SCALE	1/24
DRAWN	J.ALMANRIC	CHECKED		SIZE	"C"

CASTEEL DWG: 04 OF 05 — REV. 0

Engineering Div
Route Slip
Date Rec: 10/5/94

MTX #: 94-5575

( ) Mr. Tickner
( ) Mr. Marsalone
( ) Mrs. Jackson
( ) Mr. Settoon
( ) Mr. Fairless
( ) Mr. Picciola
( ) Mr. Laurent
( ) Mr. Flock
(✓) Mr. Guizerix
( ) Mr. Brantley
( ) Mr. Satterlee

COMMENTS:

S: 10/20/94

1 GUIZERIX
2 HASSENBOEHLER
GUGGENHEIMER
CINDY

5575

10/20 SUSPENSE DATE
DISTRIBUTE
FILE
ROUTE
RELEASE

Sewerage & Water Board OF NEW ORLEANS

G. JOSEPH SULLIVAN
General Superintendent

625 ST. JOSEPH STREET
NEW ORLEANS, LA., 70165 • 585-2365

October 3, 1994

U. S. Army Corps of Engineers
New Orleans District
P.O. Box 60267
New Orleans, Louisiana 70160-0267

Attention: Mr. Eugene Tickner
Chief of Engineering

RE: **London Avenue Outfall Canal, Parallel Protection Mirabeau Avenue to Leon C. Simon Blvd., East Bank, Mirabeau Avenue to Robert E. Lee Blvd., West Bank Electrical Submittal**

Gentlemen:

We have reviewed the electrical submittal for materials involving our feeders lines. Comments are as follows:

1. Okonite - 3/C, 500 MCM, Copper, Okoguard (EP), Shielded Lead Sheath Okoseal (PVC), 15 KV and 133% Insulation Level Power Cable as per the Okonite Company Drawing No. CS-7070, Rev. B is approved.

2. Mac-Polymic Insulated Lead Sheath Cable, Three-Conductor, 15 KV, Type RLS3 Splice Kits are approved.

3. Wheatland or Triangle - Galvanized rigid steel conduit, is approved.

4. T&B - Conduit Pipe Spacers Cat. No. 1354 and Straps Cat. No. 1287 are approved.

5. Stainless Steel High Strength Bolts for conduit straps are approved.

Please provide a submittal on the cable splice enclosures.

Attached are six (6) copies of this submittal.

Very truly yours,

Joseph L. Sullivan

GENERAL SUPERINTENDENT

GJS/CTP/S
Attachments

CC: Mr. R. St. Germain
Mr. J. Huerkamp
Mr. G. Sarrat
Mr. C. Perret

Designation: A 193/A 193M – 93a

Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service[1]

This standard is issued under the fixed designation A 193/A 193M; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This specification has been approved for use by agencies of the Department of Defense. Consult the DoD Index of Specifications and Standards for the specific year of issue which has been adopted by the Department of Defense.

1. Scope

1.1 This specification[2] covers alloy and stainless steel bolting material for pressure vessels, valves, flanges, and fittings for high-temperature service. The term "bolting material" as used in this specification covers bars, bolts, screws, studs, stud bolts and wire. Bars and wire shall be hot-wrought. The material may be further processed by centerless grinding or by cold drawing. Austenitic stainless steel may be solution-annealed or annealed and strain-hardened.

1.2 Several grades are covered, including ferritic steels and austenitic stainless steels designated B5, B8, etc. Selection will depend upon design, service conditions, mechanical properties, and high-temperature characteristics.

NOTE 1—The committee formulating this specification has included fifteen steel types that have been rather extensively used for the present purpose. Other compositions will be considered for inclusion by the committee from time to time as the need becomes apparent.

NOTE 2—For grades of alloy-steel bolting material suitable for use at the lower range of high-temperature applications, reference should be made to Specification A 354.

NOTE 3—For grades of alloy-steel bolting material suitable for use in low-temperature applications, reference should be made to Specification A 320/A 320M.

1.3 Nuts for use with this bolting material are covered in Section 14.

1.4 Supplementary Requirements S1 through S8 are provided for use when additional tests or inspection are desired. These shall apply only when specified in the purchase order.

1.5 This specification is expressed in both inch-pound units and in SI units. However, unless the order specifies the applicable "M" specification designation (SI units), the material shall be furnished to inch-pound units.

1.6 The values stated in either inch-pound units or SI units are to be regarded separately as standard. Within the text, the SI units are shown in brackets. The values stated in each system are not exact equivalents; therefore, each system must be used independently of the other. Combining values from the two systems may result in nonconformance with the specification.

2. Referenced Documents

2.1 *ASTM Standards:*

A 29/A 29M Specification for General Requirements for Steel Bars, Carbon and Alloy, Hot-Wrought and Cold-Finished[3]

A 194/A 194M Specification for Carbon and Alloy Steel Nuts for Bolts for High-Pressure and High-Temperature Service[4]

A 320/A 320M Specification for Alloy Steel Bolting Materials for Low-Temperature Service[4]

A 354 Specification for Quenched and Tempered Alloy Steel Bolts, Studs, and Other Externally Threaded Fasteners[4,5]

A 370 Test Methods and Definitions for Mechanical Testing of Steel Products[4,6]

A 479/A 479M Specification for Stainless and Heat-Resisting Bars and Shapes for Use in Boilers and Other Pressure Vessels[3]

A 484/484 M Specification for General Requirements for Stainless and Heat-Resisting Bars, Billets, and Forgings[3]

A 788 Specification for Steel Forgings, General Requirements[3]

E 18 Test Methods for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials[7]

E 21 Practice for Elevated Temperature Tension Tests of Metallic Materials[7]

E 139 Practice for Conducting Creep, Creep-Rupture, and Stress-Rupture Tests of Metallic Materials[7]

E 150 Practice for Conducting Creep and Creep-Rupture Tension Tests of Metallic Materials Under Conditions of Rapid Heating and Short Times[8]

E 151 Practice for Tension Tests of Metallic Materials at Elevated Temperatures with Rapid Heating and Conventional or Rapid Strain Rates[8]

E 292 Practice for Conducting Time-for-Rupture Notch Tension Tests of Materials[7]

[1] This specification is under the jurisdiction of ASTM Committee A-1 on Steel, Stainless Steel, and Related Alloys and is the direct responsibility of Subcommittee A01.22 on Valves, Fittings, Bolting, and Flanges for High and Subatmospheric Temperatures.

Current edition approved April 15, 1993. Published July 1993. Originally published as A 193 – 36 T. Last previous edition A 193/A 193M – 93.

[2] For ASME Boiler and Pressure Vessel Code applications see related Specification SA-193 in Section II of that Code.

[3] *Annual Book of ASTM Standards*, Vol 01.05.

[4] *Annual Book of ASTM Standards*, Vol 01.01.

[5] *Annual Book of ASTM Standards*, Vol 15.08.

[6] *Annual Book of ASTM Standards*, Vol 01.03.

[7] *Annual Book of ASTM Standards*, Vol 03.01.

[8] Discontinued, see *1983 Annual Book of ASTM Standards*, Vol 03.01.

E 328 Methods for Stress-Relaxation Tests for Materials and Structures[7]
E 381 Method of Macroetch Testing, Inspection, and Rating Steel Products, Comprising Bars, Billets, Blooms and Forgings[7]
E 566 Practice for Electromagnetic (Eddy-Current) Sorting of Ferrous Metals[9]
E 709 Guide for Magnetic Particle Examination[9]
F 606 Test Methods for Determining the Mechanical Properties of Externally and Internally Threaded Fasteners, Washers, and Rivets[10]
2.2 *ANSI Standards:*[11]
B1.1 Screw Threads
B18.2.1 Square and Hex Bolts and Screws
B18.3 Hexagon Socket and Spline Socket Screws

3. Ordering Information

3.1 The inquiry and order for material under this specification shall include the following as required to describe the material adequately:

3.1.1 Specification, designation, year date, and grade.

3.1.2 Heat-treated condition (that is, normalized and tempered, or quenched and tempered, for the ferritic materials, and solution treated **(Class 1)**, solution treated after finishing (Class 1A), and annealed-and-strain-hardened (Class 2), for the austenitic stainless steels; Classes 1B and 1C apply to the solution-treated nitrogen-bearing stainless steels); Class ID applies to material solution treated by cooling rapidly from the rolling temperature,

3.1.3 Quantity (that is, number of pieces or weight),

3.1.4 Description of items required (that is, bars, bolts, screws, or studs),

3.1.5 Dimensions (that is, diameter, length of point, overall length, finish, shape, and threads),

3.1.6 Nuts, if required by purchaser, in accordance with 14.1,

3.1.7 Supplementary requirements, if any, and

3.1.8 Special requirements, in accordance with 6.3, 6.6, 13.3, 15.1, 16.1, 17.1, and 18.1.

4. Manufacture (Process)

4.1 The steel shall be produced by any of the following processes: open-hearth, basic-oxygen, electric-furnace or vacuum-induction melting (VIM). The primary melting method may incorporate separate degassing or refining. The molten steel may be vacuum-treated prior to or during pouring of the ingot or strand casting. The basic-oxygen process shall be limited to steels containing not over 6 % chromium.

4.2 *Quality*—The producer quality control procedures shall provide sufficient testing of Carbon and Alloy Steels in accordance with Method E 381 as stipulated in Sections 5, 7, and 8 or other suitable method as agreed upon between the purchaser and the producer to assure the internal quality of the product. A bar lot consisting of one heat or 10 000 lbs whichever is smaller, shall be represented by a minimum of one macroetch. Visual examination of transverse sections shall show no imperfections worse than the macrographs of Method E 381 S4-R4-C4 or equivalent as agreed upon. Distinct zones of solidification shall not be present.

5. Discard

5.1 A sufficient discard shall be made to secure freedom from injurious piping and undue segregation.

6. Heat Treatment

6.1 Ferritic steels shall be properly heat treated as best suits the high-temperature characteristics of each grade. Immediately after rolling or forging, the bolting material shall be allowed to cool to a temperature below the cooling transformation range. The materials which are to be furnished in the liquid-quenched condition shall then be uniformly reheated to the proper temperature to refine the grain (a group thus reheated being known as a "quenching charge") and quenched in a liquid medium under substantially uniform conditions for each quenching charge. The materials that are to be furnished in the normalized or air-quenched condition shall be reheated to the proper temperature to refine the grain and cooled uniformly in air to a temperature below the transformation temperature range. The material, whether liquid-quenched or normalized, shall then be uniformly reheated for tempering. The minimum tempering temperature shall be as specified in Table 2.

6.1.1 Quenched and tempered or normalized and tempered ferritic material that is subsequently cold drawn for dimensional control shall be stress-relieved after cold drawing. The minimum stress-relief temperature shall be 100°F [55°C] below the tempering temperature. Tests for mechanical properties shall be performed after stress relieving.

6.2 Both B6 and B6X materials shall be held, at the tempering temperature for a minimum time of 1 h. Identification Symbol B6X material may be furnished in the as-rolled-and-tempered condition. Cold working is permitted with the hardness limitation (26 HRC maximum) of Table 2 for the B6X grade.

6.3 Austenitic stainless steels shall receive a carbide solution treatment. After rolling, forging or heading, whether done hot or cold, the material shall be heated from ambient temperature and held a sufficient time at a temperature at which the chromium carbide will go into solution and then shall be cooled at a rate sufficient to prevent the precipitation of the carbide. Material thus treated is described as **Class 1**, Class 1B, or Class 1C. Alternatively, rolled or forged bar (except for grades 321 and 347) may be cooled rapidly immediately following hot working while the temperature is above 1750°F (955°C), so that grain boundary carbides are in solution, (see Specification A 479 – 88b and subsequent revisions). Material so treated is identified as Class 1D and shall be restricted to applications at temperatures less than 850°F (455°C). If specified in the purchase order, material shall be solution treated in the finished condition; material so treated is described as Class 1A.

6.4 If scale-free bright finish is required, this shall be specified in the purchase order.

[9] *Annual Book of ASTM Standards*, Vol 03.03.
[10] *Annual Book of ASTM Standards*, Vol 15.08.
[11] Available from American National Standards Institute, 11 West 42nd St., 13th Floor, New York, NY 10036.

TABLE 1 Chemical Requirements (Composition, percent)[A]

Type	Ferritic Steels			
Identification Symbol	B5		B6 and B6X	
Grade	5 % Chromium (AISI Type 501)		12 % Chromium (AISI Type 410)	
			AISI Type 410	
	Range	Product Variation, Over or Under[B]	Range	Product Variation, Over or Under[B]
Carbon	0.10 min	0.01 under	0.15 max	0.01 over
Manganese, max	1.00	0.03 over	1.00	0.03 over
Phosphorus, max	0.040	0.005 over	0.040	0.005 over
Sulfur, max	0.030	0.005 over	0.03	0.005 over
Silicon	1.00 max	0.05 over	1.00 max	0.05 over
Chromium	4.00–6.00	0.10	11.50–13.50	0.15
Molybdenum	0.40–0.65	0.05	...	...

Type	Ferritic Steels			
Identification Symbol	B7, B7M		B16	
Grade	Chromium-Molybdenum (AISI 4140, 4142, 4145, 4140 H, 4142 H, and 4145 H)		Chromium-Molybdenum-Vanadium	
	Range	Product Variation, Over or Under[B]	Range	Product Variation, Over or Under[B]
Carbon	0.37–0.49	0.02	0.36–0.47	0.02
Manganese	0.65–1.10	0.04	0.45–0.70	0.03
Phosphorus, max	0.035	0.005 over	0.035	0.005 over
Sulfur, max	0.040	0.005 over	0.040	0.005 over
Silicon	0.15–0.35	0.02	0.15–0.35	0.02
Chromium	0.75–1.20	0.05	0.80–1.15	0.05
Molybdenum	0.15–0.25	0.02	0.50–0.65	0.03
Vanadium	...	...	0.25–0.35	0.03

Type	Austenitic Steels,[D] Classes 1, 1A, 1D, and 2							
Identification Symbol	B8, B8A		B8C, B8CA		B8M, B8MA B8M2, B8M3		B8P, B8PA	
Grade	Unstabilized 18 Chromium-8 Nickel (AISI Type 304)		Stabilized 18 Chromium-8 Nickel (AISI Type 347)		18 Chromium-10 Nickel-2 Molybdenum (AISI Type 316)		Unstabilized 18 Chromium-8 Nickel (AISI Type 305 with restricted carbon)	
	Range	Product Variation, Over or Under[B]	Range	Product Variation, Over or Under[B]	Range	Product Variation, Over or Under[B]	Range	Product Variation, Over or Under[B]
Carbon, max	0.08	0.01 over	0.08	0.01 over	0.08	0.01 over	0.08	0.01 over
Manganese, max	2.00	0.04 over	2.00	0.04 over	2.00	0.04 over	2.00	0.04 over
Phosphorus, max	0.045	0.010 over	0.045	0.010 over	0.045	0.010 over	0.045	0.010 over
Sulfur, max	0.030	0.005 over	0.030	0.005 over	0.030	0.005 over	0.030	0.005 over
Silicon, max	1.00	0.05 over	1.00	0.05 over	1.00	0.05 over	1.00	0.05 over
Chromium	18.00–20.00	0.20	17.00–19.00	0.20	16.00–18.00	0.20	17.00–19.00	0.20
Nickel	8.00–10.50	0.15	9.00–13.00	0.15	10.00–14.00	0.15	10.50–13.00	0.15
Molybdenum	...	...	...	...	2.00–3.00	0.10	...	...
Columbium + tantalum	...	...	10 × carbon content, min	0.05 under	...	...	...	...

Type	Austenitic Steels,[D] Classes 1A, 1B, 1D, and 2				
Identification Symbol	B8N, B8NA		B8MN, B8MNA		B8MLCuN, B8MLCuNA
Grade	(AISI Type 304N)		(AISI Type 316N)		Unstabilized, 20 Chromium, 18 Nickel, 6 Molybdenum with restricted carbon
	Range	Product Variation, Over or Under[B]	Range	Product Variation, Over or Under[B]	Range
Carbon, max	0.08	0.01 over	0.08	0.01 over	0.020
Manganese, max	2.00	0.04 over	2.00	0.04 over	1.00
Phosphorus, max	0.045	0.010 over	0.045	0.010 over	0.030
Sulfur, max	0.030	0.005 over	0.030	0.005 over	0.010
Silicon, max	1.00	0.05 over	1.00	0.05 over	0.80
Chromium	18.00–20.00	0.20	16.00–18.00	0.20	19.50–20.50
Nickel	8.00–10.50	0.15	10.00–14.00	0.15	17.50–18.50
Molybdenum	...	...	2.00–3.00	0.10	6.00–6.50
Nitrogen	0.10–0.16	0.01	0.10–0.16	0.01	0.18–0.22
Copper	...	...	...	...	0.50–1.00

(Continued)

TABLE 2 Mechanical Requirements

Grade	Diameter, in. [mm]	Minimum Tempering Temperature, °F [°C]	Tensile Strength, min, ksi [MPa]	Yield Strength, min, 0.2 % offset, ksi [MPa]	Elongation in 4 D, min, %	Reduction of Area, min, %	Hardness, max
		Ferritic Steels					
B5							
4 to 6 % chromium	up to 4 [100], incl	1100 [593]	100 [690]	80 [550]	16	50	...
B6							
13 % chromium	up to 4 [100], incl	1100 [593]	110 [760]	85 [585]	15	50	...
B6X							
13 % chromium	up to 4 [100], incl	1100 [593]	90 [620]	70 [485]	16	50	26 HRC
B7							
Chromium-molybdenum	2½ [65] and under	1100 [593]	125 [860]	105 [720]	16	50	...
	over 2½ to 4 [65 to 100]	1100 [593]	115 [795]	95 [655]	16	50	...
	over 4 to 7 [100 to 180]	1100 [593]	100 [690]	75 [515]	18	50	...
B7M[A]							
Chromium-molybdenum	2½ [65] and under	1150 [620]	100 [690]	80 [550]	18	50	235 HB or 99 HRB
	4 [101.6] and under	1150 [620]	100 [690]	80 [550]	18	50	235 BHN or 99 R/B
	over 4 to 7 [101.6 to 117.8]	1150 [620]	100 [690]	75 [515]	18	50	235 BHN or 99 R/B
B16							
Chromium-molybdenum-vanadium	2½ [65] and under	1200 [650]	125 [860]	105 [725]	18	50	...
	over 2½ to 4 [65 to 100]	1200 [650]	110 [760]	95 [655]	17	45	...
	over 4 to 7 [100 to 180]	1200 [650]	100 [690]	85 [585]	16	45	...

Class and Grade, Diameter, in. [mm]	Heat Treatment[B]	Tensile Strength, min, ksi [MPa]	Yield Strength, min, 0.2 % offset, ksi [MPa]	Elongation in 4 D, min, %	Reduction of Area, min %	Hardness, max
	Austenitic Steels					
Classes 1 and 1D: B8, B8C, B8M, B8P, B8T, B8LN, B8MLN, all diameters	carbide solution treated	75 [515]	30 [205]	30	50	223 HB[C] or 96 HRB
Class 1A: B8A, B8CA, B8MA, B8PA, B8TA, B8LNA, B8MLNA, B8NA, B8MNA, B8MLCuNA all diameters	carbide solution treated in the finished condition	75 [515]	30 [205]	30	50	192 HB or 90 HRB
Classes 1B and 1D: B8N, B8MN, and B8MLCuN all diameters	carbide solution treated	80 [550]	35 [240]	30	40	223 HB[C] or 96 HRB
Classes 1C and 1D: B8R, all diameters	carbide solution treated	100 [690]	55 [380]	35	55	271 HB or 28 HRC
B8RA, all diameters	carbide solution treated in the finished condition	100 [690]	55 [380]	35	55	271 HB or 28 HRC
B8S, all diameters	carbide solution treated	95 [655]	50 [345]	35	55	271 HB or 28 HRC
B8SA, all diameters	carbide solution treated in the finished condition	95 [655]	50 [345]	35	55	271 HB or 28 HRC
Class 2: B8, B8C, B8P, B8T, B8N, and B8MLCuN, ¾ [20] and under	carbide solution treated and strain hardened	125 [860]	100 [690]	12	35	321 HB or 35 HRC
over ¾ to 1, [20 to 25] incl		115 [795]	80 [550]	15	35	321 HB or 35 HRC
over 1 to 1¼ [25.4 to 31.6] incl		105 [725]	65 [450]	20	35	321 HB or 35 HRC
over 1¼ to 1½ [32 to 40] incl		100 [690]	50 [345]	28	45	321 HB or 35 HRC
Class 2: B8M, B8MN, B8MLCuN[D] ¾ [19.05] and under	carbide solution treated and strain hardened	110 [760]	95 [665]	15	45	321 HB or 35 HRC
over ¾ to 1 [19.05 to 25.4] incl		100 [690]	80 [550]	20	45	321 HB or 35 HRC
over 1 to 1¼ [25.4 to 31.6] incl		95 [655]	65 [450]	25	45	321 HB or 35 HRC
over 1¼ to 1½ [31.6 to 37.9] incl		90 [620]	50 [345]	30	45	321 HB or 35 HRC

(Continued)

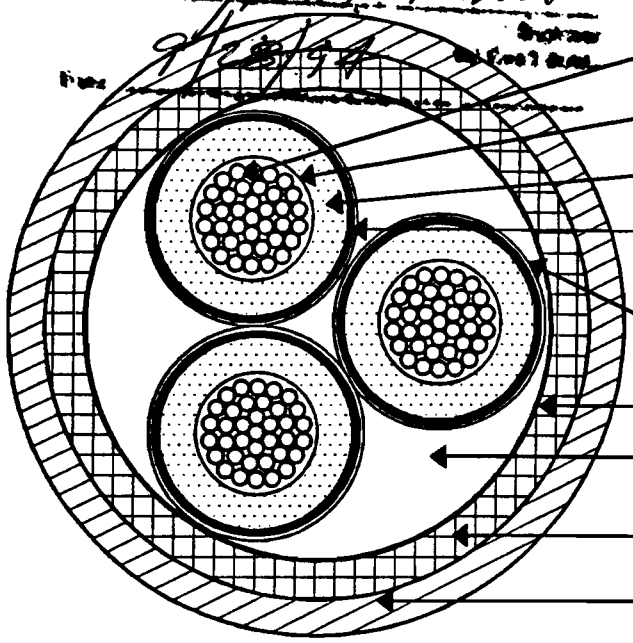
APPROVED

☐ APP. AS NOTED ☐ REJECTED

The approval of this drawing is limited only to general compliance with contract requirements and design and does not relieve the contractor of responsibility for errors, discrepancies, omissions or other requirements of the contract obligations.

Approved by Clayton T. Perret Engineer

Date 4/28/94



500 kcmil (37x) BARE CLASS B STRANDED COPPER CONDUCTOR NOMIAL OD = 0.793" (A)

EXTRUDED SEMICONDUCTING STRAND SCREEN (EPR) 0.020" (B)

INSULATION - .220" OKOGUARD® (EPR) NOM. OD=1.294"

0.032" EXTRUDED SEMICONDUCTING INSULATION SCREEN (EPR) NOM. OD=1.372" (A)

0.005" BARE COPPER TAPE SHIELD, 12½% LAP (A)

BINDER TAPE (NEOPRENE/NYLON) (A)

POLYPROPYLENE FILLERS

0.110" COPPER BEARING LEAD SHEATH NOM. OD= 3.228" (A)

0.095" JACKET-OKOSEAL® (PVC) NOM. OD= 3.432"

NOMINAL CABLE WEIGHT = 13298 LBS/1000FT (A)

COLOR CODE = BLACK / WHITE / BLUE LONGITUDINAL MYLAR TAPES (A) UNDER COPPER TAPE SHIELD

CABLE PRINT LEGEND:

OKONITE _ 3/C 500 KCMIL CU OKOGUARD (EP) - PVC 15KV SHLD 133% INSUL LEVEL 220 MILS {LIGHTNING BOLT POWER CABLE ID}

NEW ORLEANS SEWER AND WATER BOARD (A)
OKONITE REFERENCE No. O-129

THIS DRAWING IS CERTIFIED TO BE CORRECT James V Fitzgerald

3/C 500 KCMIL OKOGUARD SHLD LEAD SHEATH OKOSEAL(PVC) 15KV 133% INSUL LEV POWER CABLE

THE OKONITE COMPANY RAMSEY, NJ USA	DATE: 11-16-93 SCALE: NTS	REVISIONS (B) 1-5-94
	DR. JAC TR. CH. APP. JVF	DRAWING NUMBER CS-7070

STRAIGHT SPLICE KIT (2 WAY)

*Polymeric Insulated Lead Sheath Cable

Three Conductor

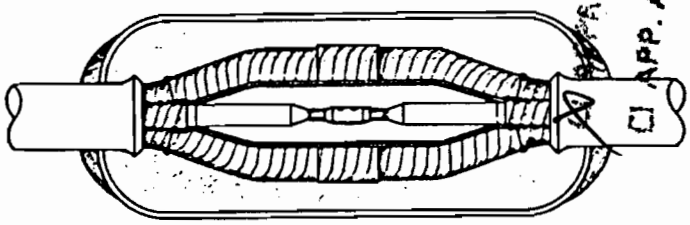
FOR A RELIABLE MEANS OF TERMINATING THIS TYPE CABLE, REFER TO THE MAC POTHEAD CATALOG OR CONSULT FACTORY

TYPE RLS3

☐ Revise & Resubmit ☐ REJECTED

☐ APP. AS NOTED ☐ APPROVED

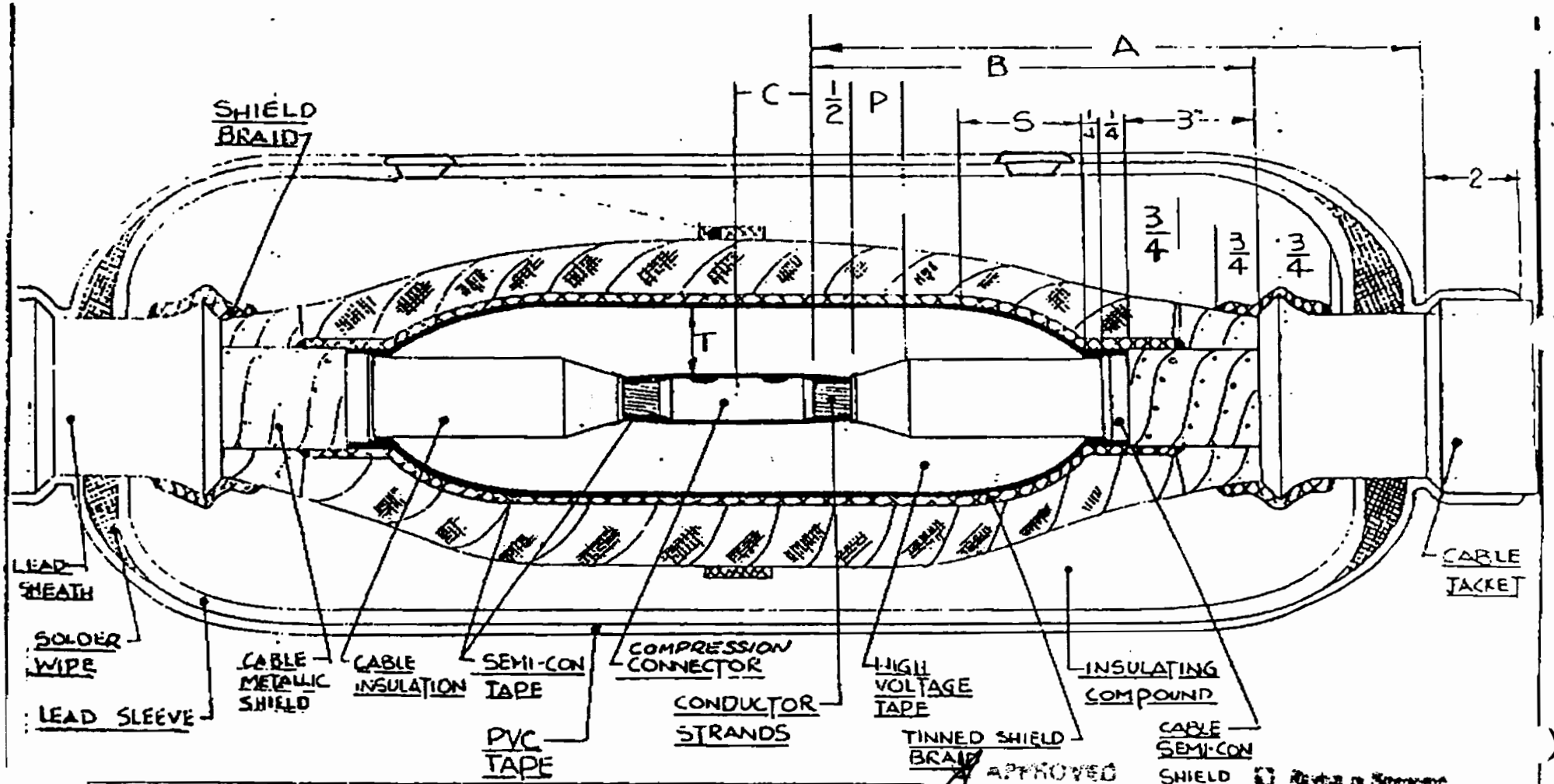
A complete unit splice kit for making a straight, 2 way splice of a three conductor rubber, cross-linked polyethylene or other *polymeric cable with a lead sheath. The MAC RLS 3 is complete with step by step installation instructions and all the proper grade materials necessary for making the splice.



CABLE SIZE	5 KV 7.5 KV GRD. CATALOG NUMBER	7.5 KV UNGRD. 15 KV GRD. CATALOG NUMBER	15 KV UNGRD. CATALOG NUMBER	27 KV GRD. CATALOG NUMBER	35 KV GRD. CATALOG NUMBER
8	RLS3-108	RLS3-208	RLS3-308	----	----
6	RLS3-106	RLS3-206	RLS3-306	----	----
4	RLS3-104	RLS3-204	RLS3-304	----	----
2	RLS3-102	RLS3-202	RLS3-302	RLS3-402	----
1	RLS3-101	RLS3-201	RLS3-301	RLS3-401	RLS3-501
1/0	RLS3-110	RLS3-210	RLS3-310	RLS3-410	RLS3-510
2/0	RLS3-120	RLS3-220	RLS3-320	RLS3-420	RLS3-520
3/0	RLS3-130	RLS3-230	RLS3-330	RLS3-430	RLS3-530
4/0	RLS3-140	RLS3-240	RLS3-340	RLS3-440	RLS3-540
250	RLS3-1250	RLS3-2250	RLS3-3250	RLS3-4250	RLS3-5250
300	RLS3-1300	RLS3-2300	RLS3-3300	RLS3-4300	RLS3-5300
350	RLS3-1350	RLS3-2350	RLS3-3350	RLS3-4350	RLS3-5350
400	RLS3-1400	RLS3-2400	RLS3-3400	RLS3-4400	RLS3-5400
500	RLS3-1500	RLS3-2500	[illegible]	RLS3-4500	RLS3-5500
600	RLS3-1600	RLS3-2600	RLS3-3600	RLS3-4600	RLS3-5600
750	RLS3-1750	RLS3-2750	RLS3-3750	RLS3-4750	RLS3-5750
1000	RLS3-11000	RLS3-21000	RLS3-31000	RLS3-41000	RLS3-51000

NOTE: All catalog numbers on this page refer to copper conductors only. Add suffix—AC if ordering or specifying aluminum.

*Polymeric is a term used to describe the following insulations Oil Base Rubber, Butyl Rubber, PVC, Low and High Density Polyethylene, Ethylene Propylene Rubber, and Cross Linked Polyethylene



VOLTAGE	A	B	C	S	P	T
15kV. ungr.	15"	9 1/4"	1 1/8"	3 1/4"	2"	3/8"

☒ APPROVED ☐ Revise & Resubmit

☐ APP. AS NOTED ☐ REJECTED

The approval of this drawing is limited only to purpose compliance with contract requirements and design but not to dimensions, quantities or details of construction.

It shall not relieve the contractor of the responsibility for errors, discrepancies, omissions or other requirements of his contract obligation.

Approved by Clayton T. Rouse
Engineer for Plant Dept.

Date 9/28/94

STRAIGHT SPLICE 3/C POLYMERIC INSULATED, LEAD COVERED, SHIELDED

NOTA SIZE CRIMP SLEEVE FOR 400 MCM X 500 MCM.

Rigid Steel Conduit

MFG. BY WHEATLAND or TRIANGLE

SIZED AS NEEDED

Ten-Foot Lengths with One Coupling
Available in hot dipped galvanized or electro-galvanized. Furnished in 10-foot lengths with both ends threaded, with coupling screwed on one end.

Size In.	Wt. Lbs. Per 100 Ft.	Outside Diameter Inches	Wall Thickness Inches
½	79	.840	.109
¾	105	1.050	.113
1	153	1.315	.133
1¼	201	1.660	.140
1½	249	1.900	.145
2	334	2.375	.154
2½	527	2.875	.203
3	690	3.500	.216
3½	831	4.000	.226
4	982	4.500	.237
5	1334	5.563	.258
6	1770	6.625	.280

☐ Revise & Resubmit ☐ REJECTED

☐ APP. AS NOTED

Approved by _____ Date 9/28/94

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CONDUIT FITTINGS (continued)

Pipe Straps

- *Steel.*
- *Designed to fit conduit snugly.*
- *High reinforcing ribs increase strength, reduce weight.*

Catalog Number	Size	Bolt Size	Unit Qty.	Std. Pkg.	Wt. per 100	Trade Cost Per 100 Less Than Unit Pkg.	Unit Pkg.	Std. Pkg.	NAED Number
1210	½"	¼"	100	500	6	$ 36.24	$ 26.31	$ 22.65	786210-01210
1211	⅝"	¼"	100	500	10	27.05	21.13	18.91	786210-01211
1212	¾"	¼"	50	500	13	33.87	26.83	20.67	786210-01212
1213	1"	¼"	50	100	21	65.55	51.21	40.67	786210-01213
1214	1¼"	⅜"	25	100	30	83.79	65.48	52.37	786210-01214
1215	1½"	⅜"	10	50	38	106.60	83.26	65.63	786210-01215
1216	2"	⅜"	5	25	48	190.43	148.77	119.02	786210-01216

LR 2684

UL not applicable.

Pipe Straps

- *Malleable iron.*

Catalog Number	Size	Bolt Size	Unit Qty.	Std. Pkg.	Wt. per 100	Trade Cost Per 100 Less Than Unit Pkg.	Unit Pkg.	Std. Pkg.	NAED Number
1275	½"	¼"	100	500	5	$ 46.11	$ 36.02	$ 28.82	786210-01275
1276	⅝"	¼"	100	500	5	41.42	32.36	25.89	786210-01276
1277	¾"	¼"	100	500	6	59.12	46.19	36.95	786210-01277
1278	1"	¼"	50	100	9	83.65	65.81	52.41	786210-01278
1279	1¼"	⅜"	25	100	16	156.32	122.12	97.76	786210-01279
1280	1½"	⅜"	25	50	22	183.28	143.17	114.54	786210-01280
1281	2"	½"	5	25	41	358.08	279.75	223.80	786210-01281
1282	2½"	½"	5	25	71	732.84	572.53	458.03	786210-01282
1283	3"	½"	5	10	100	969.24	757.22	605.78	786210-01283
1284	3½"	⅝"	1	5	140	1499.48	1171.41	937.13	786210-01284
1285	4"	⅝"	1	5	155	3326.32	2600.25	2080.20	786210-01285
1286	4½"	⅝"	1	5	205	5608.17	6181.07	4126.86	786210-01286
1287	5"	⅝"	1	5	245	–	9153.33	7322.66	786210-01287
1288	6"	⅝"	–	1	395	–	–	7858.49	786210-01288

LR 2684

UL not applicable.

APPROVED
REVISED & RESUBMIT
APP. AS NOTED
REJECTED

The approval of this drawing is limited only to general compliance with contract requirements and design but not to dimensions, quantities or details of construction.

It shall not relieve the contractor of the responsibility for errors, discrepancies, omissions or other requirements of the contract obligation.

Approved by Clayton L. Reed
Engineer
for Plant Manager

Date 9/28/94

CONDUIT FITTINGS (continued)

Corrosion Resistant PVC Coated Rigid Conduit Straps

- *Malleable iron.*

Catalog Number	Size	Bolt Size	Unit Qty.	Std. Pkg.	Wt. per 100	Trade Cost Per 100 Less Than Unit Pkg.	Unit Pkg.	Std. Pkg.	NAED Number
1275CR	¾"	¼"	100	500	5	$ 278.64	$ 211.43	$ 169.15	786210-82646
1276CR	½"	¼"	100	500	5	255.55	199.65	159.72	786210-82647
1277CR	¾"	¼"	50	500	6	309.31	241.65	193.32	786210-82649
1278CR	1"	¼"	50	100	9	487.40	380.78	304.63	786210-82662
1279CR	1¼"	⅜"	25	100	16	811.90	478.05	382.44	786210-82668
1280CR	1½"	⅜"	25	50	22	806.88	630.36	504.29	786210-82670
1281CR	2"	½"	5	25	41	1171.58	915.30	732.24	786210-82679

LR 2884

UL not applicable.

Entrance Ells*

- *Aluminum.*

Thomas & Betts entrance ells mount flat against wall eliminating need for offsetting the conduit. Designed for a straight pull in either direction and carefully bushed, these entrance ells make it easy to pull heavy wires without damage to insulation.

Catalog Number	Size	Unit Qty.	Std. Pkg.	Wt. per 100	Trade Cost Per 100 Less Than Unit Pkg.	Unit Pkg.	Std. Pkg.	NAED Number
1490	½"	10	50	25	$ 497.88	$ 388.35	$ 310.68	786210-01490
1491	¾"	10	50	32	616.46	481.61	385.29	786210-01491
1492	1"	5	25	50	1002.48	783.18	626.55	786210-01492
1493	1¼"	2	10	80	1378.28	1076.72	861.38	786210-01493
1494	1½"	2	10	116	3168.48	2475.36	1980.29	786210-01494
1495	2"	1	5	190		3760.38	3008.30	786210-01495

E 23018 LR 2284 & LR 589

* Suitable for use in hazardous location where general purpose equipment is specifically permitted by the NEC; Class I Div. 2; Class II, Div. 1 & 2; Class III, Div. 1 & 2, NEC 501-4(b); 502-4(s) (b); 503-3(a) (b).

Pipe Spacers

- *Malleable iron.*
- *Pre-mountable.*
- *Stackable to eliminate offsetting.*

APPROVED ☐ [illegible]
☐ APP. AS NOTED ☐ REJECTED

The approval of this drawing is limited only to general compliance with [illegible] requirements and design but not to [illegible] details of construction. The contractor remains responsible for [illegible] dimensions or other requirements of his [illegible] contract.

Catalog Number	Size	Unit Qty.	Std. Pkg.	Wt. per 100	Trade Cost Per 100 Less Than Unit Pkg.	Unit Pkg.	Std. Pkg.	NAED Number
1350	½"-¾"-1"	50	100	10	$ 109.65	$ 84.91	$ 67.93	786210-01350
1351	1¼"-1½"-2"	25	50	25	297.50	232.47	185.98	786210-01351
1352	2½"-3"	10	20	56	680.76	688.11	550.49	786210-01352
1353	3½"-4"	1	5	77	2639.85	2061.76	1649.41	786210-01353
1354	4½"-5"-6"	1	4	138	13010.56	10164.50	8131.60	786210-01354

LR 2884

UL not applicable.

Date 9/29/94

ROUTING OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE FOR APPROVAL

(Used to route ENG Form 4025 with items attached. Not to become a part of the Contractor's record.)

	TO:	FROM:	DATE
1	C/Const Div	Area Engineer, New Orleans	9/20/94

The attached items listed on ENG Form 4025 are forwarded for approval action.

CONTRACT NUMBER	CONTRACTOR
94-C-0079	B+K Const. Co., Inc.
TRANSMITTAL NUMBERS Item #21 Branch Closure Plan	**PROJECT TITLE AND LOCATION** London Ave Canal Floodwall - Mirabeau to Leon C. Simon.

COMMENTS (Attach additional sheet, if necessary.)
Request your office review the attached Branch Closure Plan submittal for the subject contract. Furnish any comments to NOAD by COB 30 Sept 94. POC is Chris Wegmann x1222.

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
1	DENNIS DUHON, Supv C.O. Engr	

	TO:	FROM:	DATE
2	C/Engr. Div	C/Const. Div SEP 20 1994	9/20/94

COMMENTS (Attach additional sheet, if necessary.)
Request your office review the Branch Closure Plan. ~~Plan~~ Furnish any comments to Const Div by COB 29 Sept 94. POC is Jim Berry x1240

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
	RICHARD T. HILL	

	TO:	FROM:	DATE
3	C/Const Div	C/Engr Div	9/26/94

COMMENTS (Attach additional sheet, if necessary.)
Recommended for approval. See attached comments.

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
2	W. Eugene Tickner C/Engr Div	

	TO:	FROM:	DATE
4			

The following action codes are given to items listed on ENG Form 4025:

ACTION CODES

A - APPROVED AS SUBMITTED.

B - APPROVED, EXCEPT AS NOTED ON DRAWINGS. RESUBMISSION NOT REQUIRED.

C - APPROVED, EXCEPT AS NOTED ON DRAWINGS. REFER TO ATTACHED SHEET. RESUBMISSION REQUIRED.

D - WILL BE RETURNED BY SEPARATE CORRESPONDENCE.

E - DISAPPROVED (SEE ATTACHED)

F - RECEIPT ACKNOWLEDGED

G - OTHER (Specify)

ACTION CODES TO BE INSERTED IN COLUMN G, SECTION I, ENG FORM 4025 (Attach sheets, when required.)

ITEM NO. (Taken from ENG Form 4025)								
CODE GIVEN								

REMARKS

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE

Hurricane Breach Closure Submittal

1. From the Contractor's drawing, we cannot tell if the breach closure is on the land side or canal side of the new I-wall. In the event, a breach closure is executed and a section of I-wall having less than 28 day strength is damaged, the Contractor shall be responsible for demolition and replacement of the damaged floodwall. The Contractor should also be aware of the close proximity of S&WB electrical feeder lines where applicable. These lines must be protected at all times.

HURRICANE BREACH CLOSURE PLAN
London Avenue Canal

The construction of the Hurricane Breach Closure Sheet Pile Wall will be constructed, when directed by the USCE engineer, from the 300 wall feet of temporary sheet piling stored on the project immediately adjacent to the breach area. A crane and pile driving hammer will be maintained on site and a complete crew of 5 men will be available to drive the sheets and close the 300 foot gap.

Crews will work 24 hours as necessary to close the 300 foot gap and will tie-in to the existing walls by lapping the installed steel sheet pile 4 feet over the flood side of the existing wall and 4 feet past the first 3000 psi monolith of the new I-wall. We will sandbag as necessary at the tie-in points to prevent seepage.

All sheets will be driven to an elevation no less than 11.5 MLG and each sheet pile will have no less than 2/3 of its length driven into the earth.

If obstructions are encountered in the pile driving process and the pile cannot be driven to 2/3 its length, suitable beams will be welded across the sheet to brace against flooding.

Enough sandbags will be stored on site out of the weather to complete the breach closure at all times.

See accompanying drawings

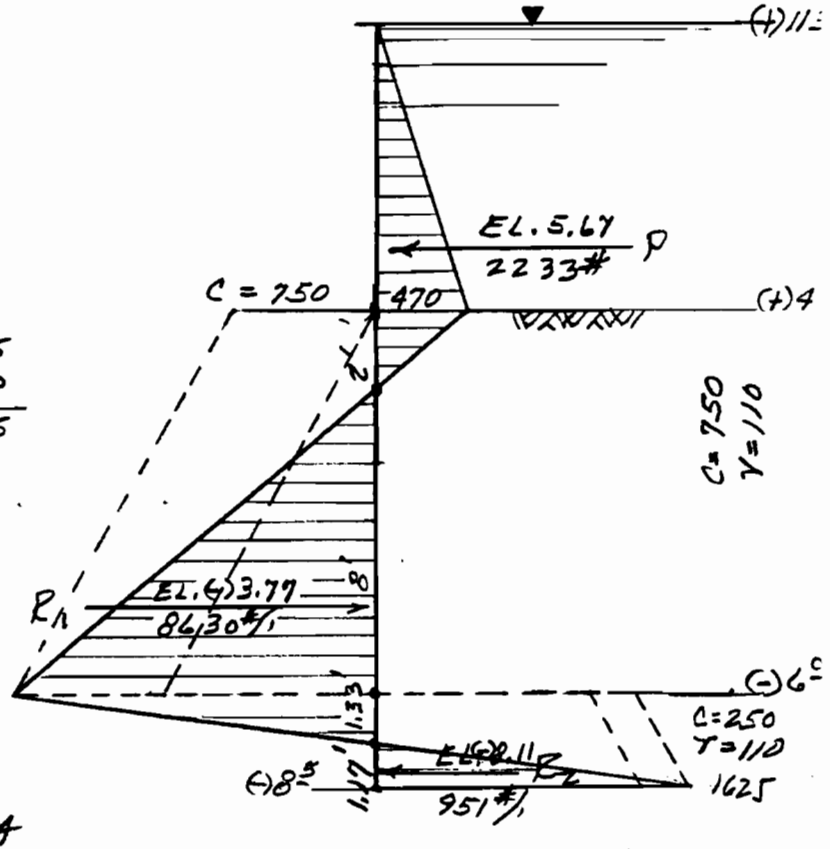
H_2O load = 7.5 x 62.4 = 470 #/LF REF. SOIL BORINGS 5-LUG & 5-LUW
DWG. NO. 94-8-5-3

10 x 110 = 1100 psf
750 / 1850 psf @ (-)6°

1100 + 2.5 x 110 = 1375
c = 250 / 1625 psf @ (-)8°

½ x 1850 x 4.33 = 1230 x 0.89 = 1095
½ x 1850 x 8 = 7400 x 4.0 = 29600
8630 x 3.57 = 30,695

½ x 2 x 470 = 470 x 8.17 = 3840
½ x 7.5 x 470 = 1763 x 5.0 = 8815
2233 x 5.67 = 12,655

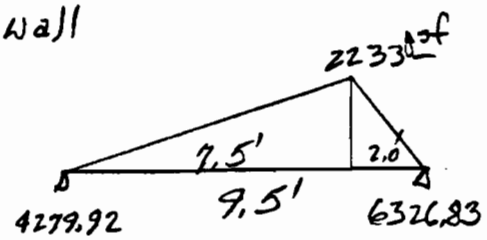


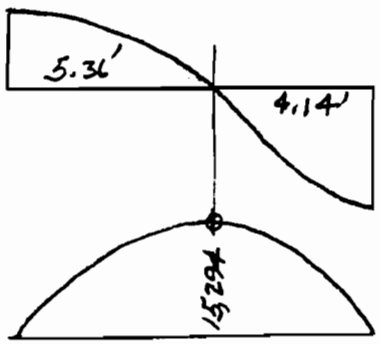
Active forces: 2233 + 951 = 3184
Passive " : 8630 > 3184 ok

M_R about R_1: 2233 x 13.78 = 30,771
M_R : 8630 x 4.34 = 37,454 > 30,771 ok

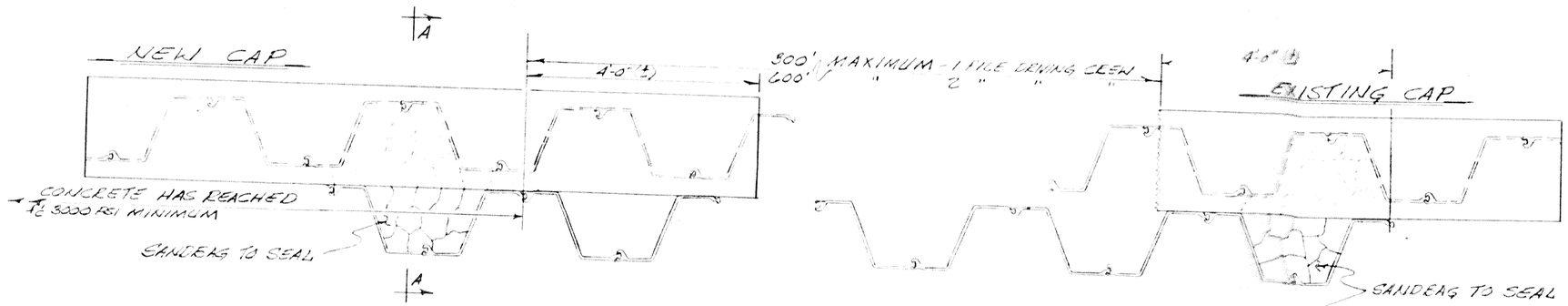
SECT. MODULUS: PZ-22 = 18.1 IN³/LF of Wall
RZ-10 = 30.5
AZ-18 = 33.5

f = 15294 x 12 / 18.1 = 10,139 psi ok

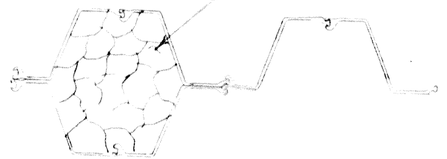




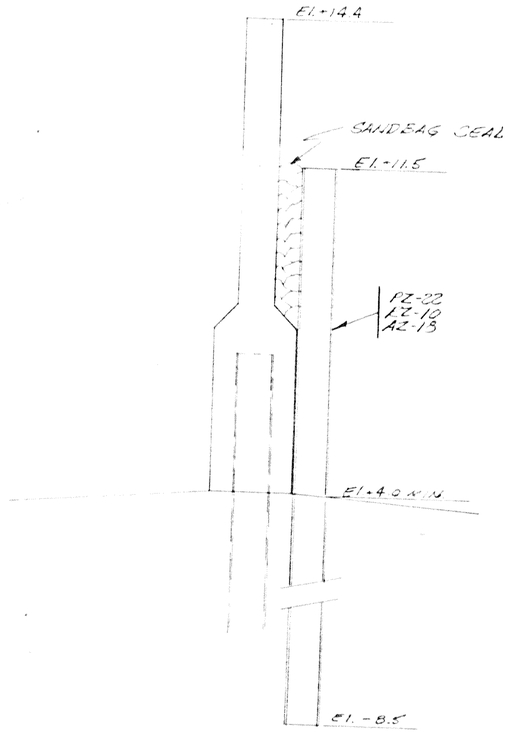
STATE OF LOUISIANA
CHARLES L. SLOAN
REG. No. 5597
REGISTERED
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING



PLAN



CONDITION WHERE NO CAP EXISTS



SECTION A-A

STATE OF LOUISIANA
CHARLES L. SLOAN
REG. No. 5597
REGISTERED
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING

C. L. SLOAN ENGINEERING, INC.
Mandeville, Louisiana

DATE	5/24/94	CLIENT	F.E.M.A. - PROJECT AGENCY-93-E 2829 LONDON AVE. OUTFALL CANAL
SCALE	NONE	TITLE	TEMPORARY FLOODWALL
BY	J.J. Sloan	DRAWING NO.	94-5-5-3

NO.	DATE	REVISION	BY

ROUTING OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE FOR APPROVAL

(Used to route ENG Form 4025 with items attached. Not to become a part of the Contractor's record.)

	TO:	FROM:	DATE
1	C/Const Div	A/E, New Orleans	9/14/94

The attached items listed on ENG Form 4025 are forwarded for approval action.

CONTRACT NUMBER	CONTRACTOR
94-C-0079	B&K Const, Inc
TRANSMITTAL NUMBERS	**PROJECT TITLE AND LOCATION**
Item No. 74 & 75 Electrical data & Shop Dwgs	London Ave Canal Fldwl, Mirabeau to Leon C. Simon

COMMENTS (Attach additional sheet, if necessary.)

Request your office review the attached electrical data & shop dwg submittal for the subject contract. Furnish any comments to NOAD by COB 23 Sept 94. POC is Chris Wagner x1222

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
1	Dennis Osbon, Supv Civ Engr	

	TO:	FROM:	DATE
2	C/Engr Div ATTN: ED-TF	C/Construction Div ATTN: Jim Berry	9-14-94

COMMENTS (Attach additional sheet, if necessary.)

Your review & comments of the attached is requested ASAP but NLT 22 Sep94. POC is Jim Berry x1240 or Al Schick x2700

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
1	RICHARD T. HILL	

	TO:	FROM:	DATE
3	C/Const Div	C/Engr Div	26 Sep 94

COMMENTS (Attach additional sheet, if necessary.)

Not recommended for approval. Please see attached comments

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
3	W. Eugene Ickner C/Engr Div	

	TO:	FROM:	DATE
4			

The following action codes are given to items listed on ENG Form 4025:

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D - WILL BE RETURNED BY SEPARATE CORRESPONDENCE.

E - DISAPPROVED (SEE ATTACHED)

F - RECEIPT ACKNOWLEDGED

G - OTHER (specify)

ACTION CODES TO BE INSERTED IN COLUMN G, SECTION I, ENG FORM 4025 (Attach sheets, when required.)

ITEM NO. (Taken from ENG Form 4025)								
CODE GIVEN								

REMARKS

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE

☆U.S. G.P.O. 1982-521-246/193

Electrical Submittal

1. According to a conversation between Clayton Perret of S&WB and Walter Baumy of Engineering Div, Mr. Perret found that the submittal lacked required technical data. Mr. Perret has discussed his concerns with the Contractor and has stated that the Contracto will resubmit.

2. Please provide 6 additional copies of the data for S&WB use. Please make sure that the copies are legible. See attached S&WB letter dated 22 Sept 94.

Sewerage & Water Board OF NEW ORLEANS

G. JOSEPH SULLIVAN
General Superintendent

625 ST. JOSEPH STREET
NEW ORLEANS, LA., 70165 • 585-2365

September 22, 1994

U.S. Army Corps of Engineers
New Orleans District
P.O. Box 60267
New Orleans, Louisiana 70160-0267

Attention: Mr. Eugene Tickner
Chief of Engineering

RE: **London Avenue Outfall Canal, Parallel Protection, Mirabeau Avenue to Robert E. Lee Boulevard, West Bank, Mirabeau Avenue to Leon C. Simon Boulevard, East Bank Electrical Submittal**

Gentlemen:

We have received submittal data on Electric Power Cable Conduit, Splice Kits, etc. intended to be furnished under subject contract.

This submittal is rejected since the printing on several sheets were unreadable.

However, Mr. Mike Commiskey of B&K Construction Company will be resubmitting the data on the above captioned contract to U.S. Army Corps of Engineers.

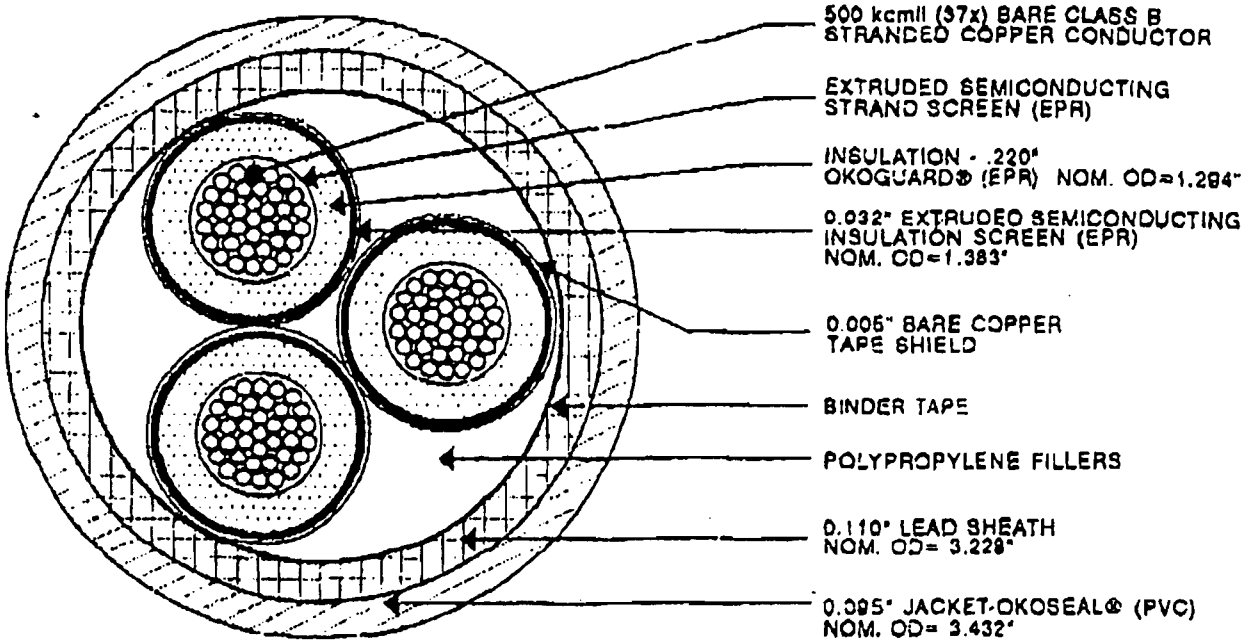
Please furnish the S&WB with six (6) copies of the above submittal for our review and approval.

Very truly yours,

GENERAL SUPERINTENDENT

GJS/CTP/S

CC: Mr. R. St. Germain
Mr. J. Huerkamp
Mr. G. Sarrat
Mr. C. Perret



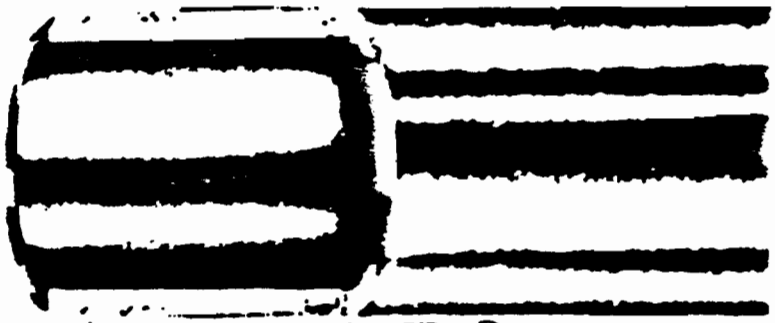
THIS DRAWING IS CERTIFIED TO BE CORRECT Daniel V Fitzpatrick 11/17/93

CABLE PRINT LEGEND: OKONITE _ 3/C 500 KCMIL CU OKOGUARD (EP) - PVC 15KV SHLD 133% INSUL LEVEL 220 MILS {LIGHTNING BOLT POWER CABLE ID}

3/C 500 KCMIL OKOGUARD SHLD LEAD SHEATH OKOSEAL(PVC) 15KV 133% INSUL LEV POWER CABLE

THE OKONITE COMPANY RAMSEY, NJ USA	DATE: 11-18-93 SCALE: NTS DR. TR. CH. APP.	REVISIONS DRAWING NUMBER CS-7070

Rigid Steel Conduit



Ten-Foot Lengths with One Coupling
Available in hot dipped galvanized or electro-galvanized. Furnished in 10-foot lengths with both ends threaded, with coupling screwed on one end.

Size In.	Wt. Lbs. Per 100 Ft.	Outside Diameter Inches	Wall Thickness Inches
½	79	.840	.109
¾	105	1.050	.113
1	153	1.315	.133
1¼	201	1.660	.140
1½	249	1.900	.145
2	334	2.375	.154
2½	527	2.875	.203
3	690	3.500	.216
3½	831	4.000	.226
4	982	4.500	.237
5	1334	5.563	.258
6	1770	6.625	.280

CONDUIT FITTINGS (continued)

Corrosion Resistant PVC Coated Rigid Conduit Straps

- *Malleable iron.*

Catalog Number	Size	Bolt Size	Unit Qty.	Std. Pkg.	Wt. per 100	Trade Cost Per 100 Less Than Unit Pkg.	Unit Pkg.	Std. Pkg.	NAED Number
1275CR	⅜"	¼"	100	500	5	$ 270.64	$ 211.43	$ 169.15	786210-82646
1276CR	½"	¼"	100	500	5	255.55	199.65	159.72	786210-82647
1277CR	¾"	¼"	50	500	6	309.31	241.65	193.32	786210-82649
1278CR	1"	¼"	50	100	9	487.40	380.78	304.63	786210-82662
1279CR	1¼"	⅜"	25	100	16	611.90	478.05	382.44	786210-82668
1280CR	1½"	⅜"	25	50	22	806.86	630.36	504.29	786210-82670
1281CR	2"	½"	5	25	41	1171.56	915.30	732.24	786210-82679

LR 2884

UL not applicable.

Entrance Ells*

- *Aluminum.*

Thomas & Betts entrance ells mount flat against wall eliminating need for offsetting the conduit. Designed for a straight pull in either direction and carefully bushed, these entrance ells make it easy to pull heavy wires without damage to insulation.

Catalog Number	Size	Unit Qty.	Std. Pkg.	Wt. per 100	Trade Cost Per 100 Less Than Unit Pkg.	Unit Pkg.	Std. Pkg.	NAED Number
1490	½"	10	50	25	$ 497.08	$ 388.35	$ 310.68	786210-01490
1491	¾"	10	50	32	616.46	481.61	385.29	786210-01491
1492	1"	5	25	50	1002.48	783.18	626.55	786210-01492
1493	1¼"	2	10	80	1378.20	1076.72	861.38	786210-01493
1494	1½"	2	10	116	3168.40	2475.36	1980.29	786210-01494
1495	2"	1	5	190		3780.38	3008.30	786210-01495

E 23018

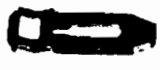
LR 2284 & LR 589

* Suitable for use in hazardous location where general purpose equipment is specificcally permitted by the NEC; Class I Div. 2; Class II, Div. 1 & 2; Class III, Div. 1 & 2, NEC 501-4(b); 502-4(s) (b); 503-3(a) (b).

Pipe Spacers

- *Malleable iron.*
- *Pre-mountable.*
- *Stackable to eliminate offsetting.*

Catalog Number	Size	Unit Qty.	Std. Pkg.	Wt. per 100	Trade Cost Per 100 Less Than Unit Pkg.	Unit Pkg.	Std. Pkg.	NAED Number
1350	½"-¾"-1"	50	100	10	$ 108.68	$ 84.91	$ 67.93	786210-01350
1351	1¼"-1½"-2"	25	50	25	297.58	232.47	185.98	786210-01351
1352	2½"-3"	10	20	56	680.78	688.11	550.49	786210-01352
1353	3½"-4"	1	5	77	2639.05	2061.76	1649.41	786210-01353
1354	4½"-5"-6"	1	4	138	13010.56	10164.50	8131.60	786210-01354



LR 2884

UL not applicable.

CONDUIT FITTINGS (continued)

Pipe Straps

- *Steel.*
- *Designed to fit conduit snugly.*
- *High reinforcing ribs increase strength, reduce weight.*

Catalog Number	Size	Bolt Size	Unit Qty.	Std. Pkg.	Wt. per 100	Trade Cost Per 100 Less Than Unit Pkg.	Unit Pkg.	Std. Pkg.	NAED Number
1210	⅜"	¼"	100	500	6	$ 36.24	$ 26.31	$ 22.65	786210-01210
1211	½"	¼"	100	500	10	27.05	21.13	16.91	786210-01211
1212	¾"	¼"	50	500	13	33.07	25.83	20.67	786210-01212
1213	1"	¼"	50	100	21	65.55	51.21	40.97	786210-01213
1214	1¼"	⅜"	25	100	30	83.79	65.46	52.37	786210-01214
1215	1½"	⅜"	10	50	38	106.60	83.26	66.63	786210-01215
1216	2"	⅜"	5	25	48	190.43	148.77	119.02	786210-01216

LR 2884

UL not applicable.

Pipe Straps

- *Malleable iron.*

Catalog Number	Size	Bolt Size	Unit Qty.	Std. Pkg.	Wt. per 100	Trade Cost Per 100 Less Than Unit Pkg.	Unit Pkg.	Std. Pkg.	NAED Number
1275	⅜"	¼"	100	500	5	$ 46.11	$ 36.02	$ 28.82	786210-01275
1276	½"	¼"	100	500	5	41.42	32.36	25.89	786210-01276
1277	¾"	¼"	100	500	6	59.12	46.18	36.95	786210-01277
1278	1"	¼"	50	100	9	83.85	65.51	52.41	786210-01278
1279	1¼"	⅜"	25	100	16	156.32	122.12	97.70	786210-01279
1280	1½"	⅜"	25	50	22	183.26	143.17	114.54	786210-01280
1281	2"	½"	5	25	41	358.08	279.75	223.80	786210-01281
1282	2½"	½"	5	25	71	732.84	572.53	458.03	786210-01282
1283	3"	½"	5	10	100	969.24	757.22	605.78	786210-01283
1284	3½"	⅝"	1	5	140	1499.40	1171.41	937.13	786210-01284
1285	4"	⅝"	1	5	155	3328.32	2600.25	2080.20	786210-01285
1286	4½"	⅝"	1	5	205	6606.17	5161.07	4128.86	786210-01286
1287	5"	⅝"	1	5	245	–	9153.33	7322.66	786210-01287
1288	6"	⅝"	–	1	395	–	–	7858.49	786210-01288

LR 2884

UL not applicable.

STRAIGHT SPLICE KIT (2 WAY)

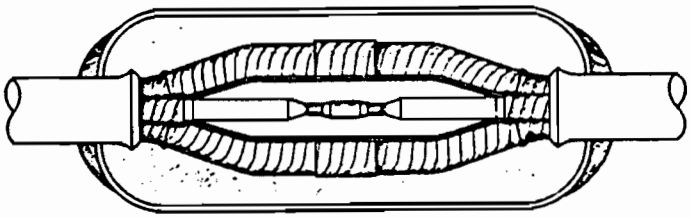
*Polymeric Insulated Lead Sheath Cable

Three Conductor

FOR A RELIABLE MEANS OF TERMINATING THIS TYPE CABLE, REFER TO THE MAC POTHEAD CATALOG OR CONSULT FACTORY

TYPE RLS3

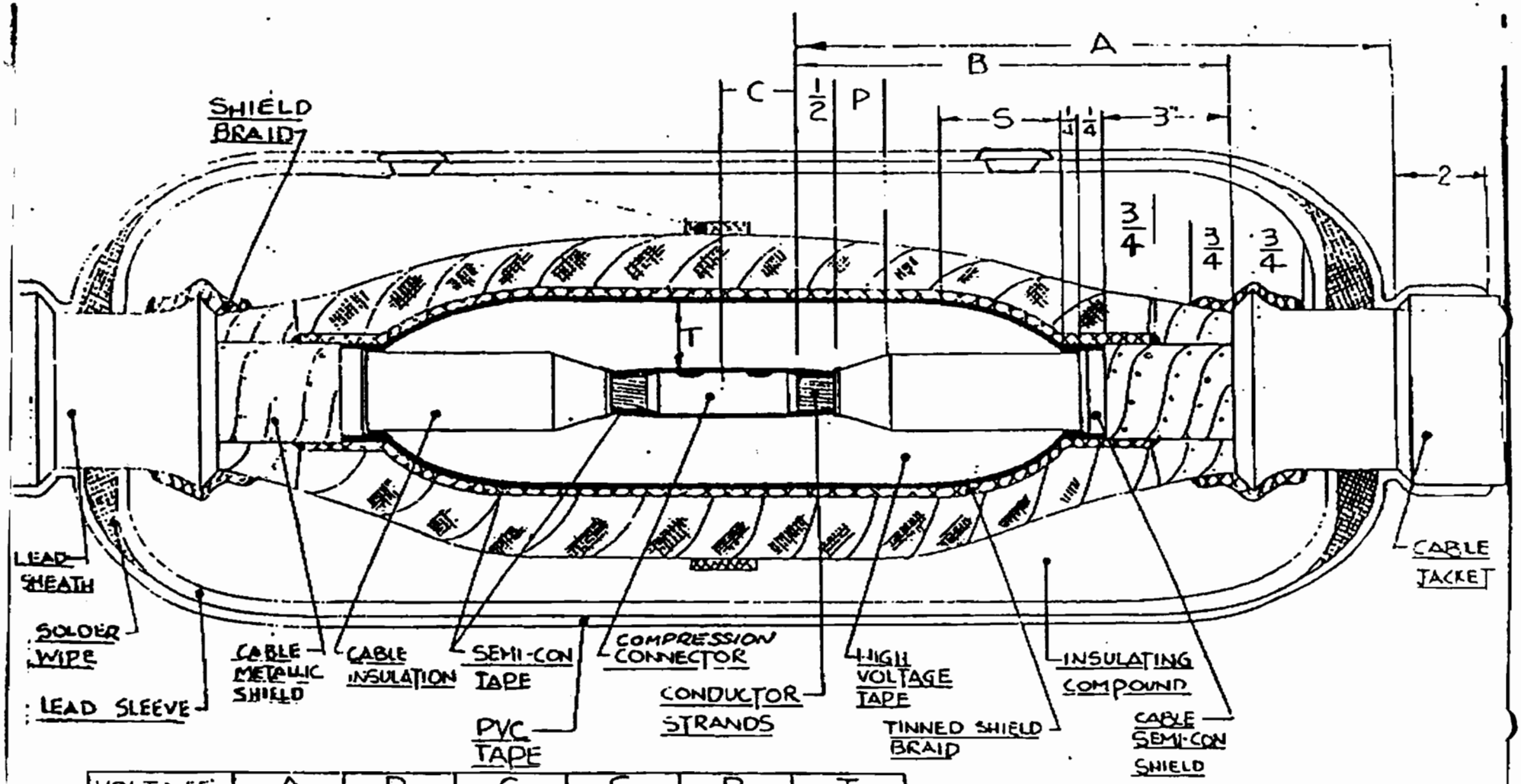
A complete unit splice kit for making a straight, 2 way splice of a three conductor rubber, cross-linked polyethylene or other *polymeric cable with a lead sheath, the MAC RLS 3 is complete with step by step installation instructions and all the proper grade materials necessary for making the splice.



CABLE SIZE	5 KV 7.5 KV GRD. CATALOG NUMBER	7.5 KV UNGRD. 15 KV GRD. CATALOG NUMBER	15 KV UNGRD. CATALOG NUMBER	27 KV GRD. CATALOG NUMBER	35 KV GRD. CATALOG NUMBER
8	RLS3-108	RLS3-208	RLS3-308	---	---
6	RLS3-106	RLS3-206	RLS3-306	---	---
4	RLS3-104	RLS3-204	RLS3-304	---	---
2	RLS3-102	RLS3-202	RLS3-302	RLS3-402	---
1	RLS3-101	RLS3-201	RLS3-301	RLS3-401	RLS3-501
1/0	RLS3-110	RLS3-210	RLS3-310	RLS3-410	RLS3-510
2/0	RLS3-120	RLS3-220	RLS3-320	RLS3-420	RLS3-520
3/0	RLS3-130	RLS3-230	RLS3-330	RLS3-430	RLS3-530
4/0	RLS3-140	RLS3-240	RLS3-340	RLS3-440	RLS3-540
250	RLS3-1250	RLS3-2250	RLS3-3250	RLS3-4250	RLS3-5250
300	RLS3-1300	RLS3-2300	RLS3-3300	RLS3-4300	RLS3-5300
350	RLS3-1350	RLS3-2350	RLS3-3350	RLS3-4350	RLS3-5350
400	RLS3-1400	RLS3-2400	RLS3-3400	RLS3-4400	RLS3-5400
500	RLS3-1500	RLS3-2500	RLS3-3500	RLS3-4500	RLS3-5500
600	RLS3-1600	RLS3-2600	RLS3-3600	RLS3-4600	RLS3-5600
750	RLS3-1750	RLS3-2750	RLS3-3750	RLS3-4750	RLS3-5750
1000	RLS3-11000	RLS3-21000	RLS3-31000	RLS3-41000	RLS3-51000

NOTE: All catalog numbers on this page refer to copper conductors only. Add suffix—AC if ordering or specifying aluminum.

*Polymeric is a term used to describe the following insulations. Oil Base Rubber, Butyl Rubber, PVC, Low and High Density Polyethylene, Ethylene Propylene Rubber, and Cross Linked Polyethylene



VOLTAGE	A	B	C	S	P	T
15kV. ungr.	15"	$9\frac{1}{4}$"	$1\frac{1}{8}$"	$3\frac{1}{4}$"	2"	$\frac{3}{8}$"

STRAIGHT SPLICE 3/C POLYMERIC INSULATED, LEAD COVERED, SHIELDED

NOTE: SIZE CRIMP SLEEVE FOR 400 MCM X 500 MCM.

ROUTING AND TRANSMITTAL S... Date 23 Sept 94

TO: (Name, office symbol, room number, building, Agency/Post)	Initials	Date
1. A. Desoto		
2.		
3.		
4.		
5.		

	Action		File		Note and Return
	Approval		For Clearance		Per Conversation
	As Requested		For Correction		Prepare Reply
	Circulate		For Your Information		See Me
	Comment		Investigate		Signature
	Coordination		Justify		

REMARKS

The tip elevation of -8.5 is adequate for a temporary Floodside sheet pile wall with crown El 4.0 and a 8 Ft crown width.

DO NOT use this form as a RECORD of approvals, concurrences, disposals, clearances, and similar actions

FROM: (Name, org. symbol, Agency/Post)	Room No.—Bldg.
Frank Vojkovich	Phone No. 1034

5041-102

GPO : 1987 O - 196-409

OPTIONAL FORM 41 (Rev. 7-76)
Prescribed by GSA
FPMR (41 CFR) 101-11.206

ROUTING OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE FOR APPROVAL

(Used to route ENG Form 4025 with items attached. Not to become a part of the Contractor's record.)

	TO:	FROM:	DATE
1	C/Const Div	Area Engineer, New Orleans	9/20/94

The attached items listed on ENG Form 4025 are forwarded for approval action.

CONTRACT NUMBER	CONTRACTOR
94-C-0079	B+K Const. Co., Inc.
TRANSMITTAL NUMBERS Item #21 Branch Closure Plan	**PROJECT TITLE AND LOCATION** Mirabeau to London Ave Canal Floodwall - Leon C. Simon.

COMMENTS (Attach additional sheet, if necessary.)
Request your office review the attached Branch Closure Plan submittal for the subject contract. Furnish any comments to NOAD by COB 30 Sept 94. POC is Chris Wegman x1222.

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
1	DENNIS DUHON, Supv Civ Engr	

	TO:	FROM:	DATE
2	C/Engr. Div	C/Const. Div SEP 20 1994	9/20/94

COMMENTS (Attach additional sheet, if necessary.)
Request your office review the Branch Closure Plan. ~~Plan~~ Furnish any comments to Const Div by COB 29 Sept 94. POC is Jim Berry x1240

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE
	RICHARD T. HILL	

	TO:	FROM:	DATE
3			

COMMENTS (Attach additional sheet, if necessary.)

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE

	TO:	FROM:	DATE
4			

The following action codes are given to items listed on ENG Form 4025:

ACTION CODES

A - APPROVED AS SUBMITTED.

B - APPROVED, EXCEPT AS NOTED ON DRAWINGS. RESUBMISSION NOT REQUIRED.

C - APPROVED, EXCEPT AS NOTED ON DRAWINGS. REFER TO ATTACHED SHEET. RESUBMISSION REQUIRED.

D - WILL BE RETURNED BY SEPARATE CORRESPONDENCE.

E - DISAPPROVED (SEE ATTACHED)

F - RECEIPT ACKNOWLEDGED

G - OTHER (specify)

ACTION CODES TO BE INSERTED IN COLUMN G, SECTION I, ENG FORM 4025 (Attach sheets, when required.)

ITEM NO. (Taken from ENG Form 4025)								
CODE GIVEN								

REMARKS

NO. OF INCL.	TYPED NAME AND TITLE	SIGNATURE

*U.S. G.P.O. 1982-521-246/393

HURRICANE BREACH CLOSURE PLAN
London Avenue Canal

The construction of the Hurricane Breach Closure Sheet Pile Wall will be constructed, when directed by the USCE engineer, from the 300 wall feet of temporary sheet piling stored on the project immediately adjacent to the breach area. A crane and pile driving hammer will be maintained on site and a complete crew of 5 men will be available to drive the sheets and close the 300 foot gap.

Crews will work 24 hours as necessary to close the 300 foot gap and will tie-in to the existing walls by lapping the installed steel sheet pile 4 feet over the flood side of the existing wall and 4 feet past the first 3000 psi monolith of the new I-wall. We will sandbag as necessary at the tie-in points to prevent seepage.

All sheets will be driven to an elevation no less than 11.5 MLG and each sheet pile will have no less than 2/3 of its length driven into the earth.

If obstructions are encountered in the pile driving process and the pile cannot be driven to 2/3 its length, suitable beams will be welded across the sheet to brace against flooding.

Enough sandbags will be stored on site out of the weather to complete the breach closure at all times.

See accompanying drawings

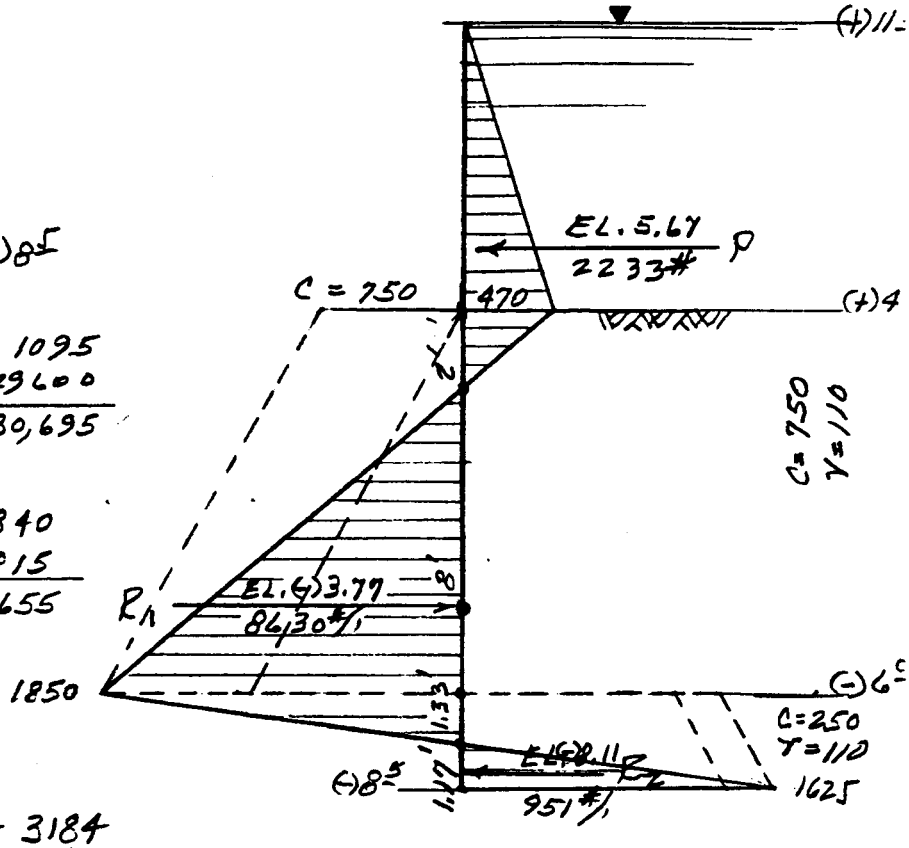
H_2O load = 7.5 x 62.4 = 470 #/LF Ref. Soil Borings S-LUG & S-LUW
DWG. NO. 94-8-5-3

10 x 110 = 1100 psf
750
1850 psf @ (-)6°

1100 + 2.5 x 110 = 1375
c = 250
1625 psf @ (-)8.5

½ x 1850 x 4.33 = 1230 x 0.89 = 1095
½ x 1850 x 8 = 7400 x 4.0 = 29600
8630 x 3.56 = 30,695

½ x 2 x 470 = 470 x 8.17 = 3840
½ x 7.5 x 470 = 1763 x 5.0 = 8815
2233 x 5.67 = 12,655

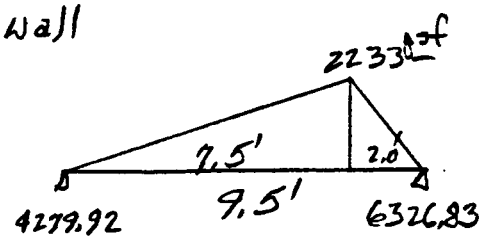


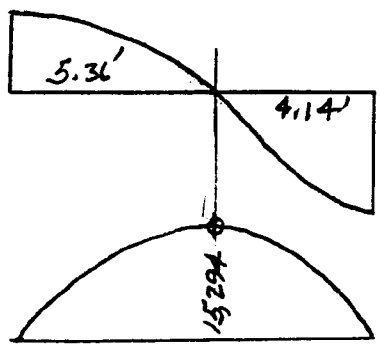
Active forces: 2233 + 951 = 3184
Passive " : 8630 > 3184 ok

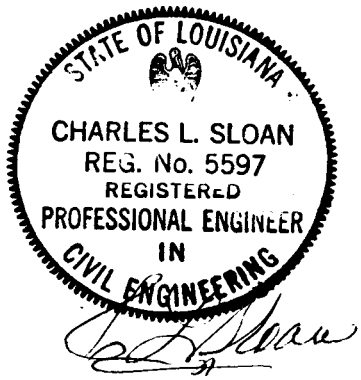
$M_{\curvearrowright}$ about R_2: 2233 x 13.78 = 30,771
$M_{\curvearrowright}$: 8630 x 4.34 = 37,454 > 30,771 ok

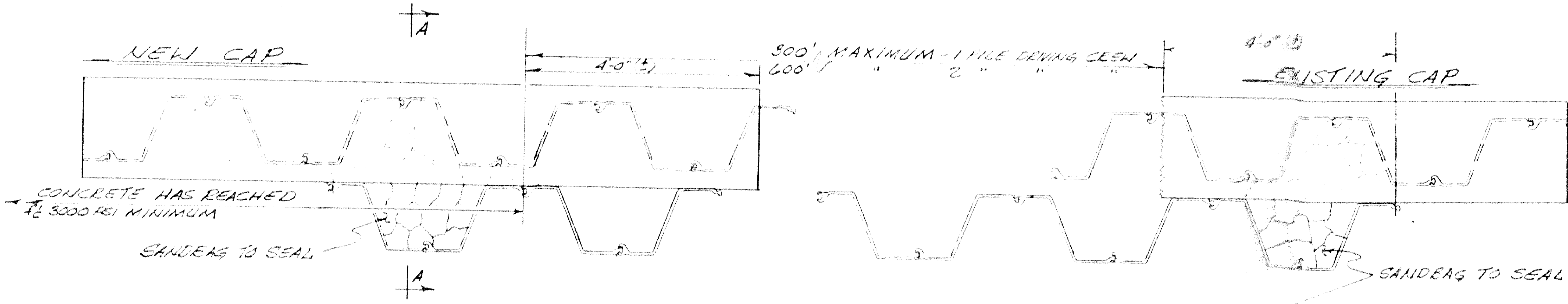
Sect. Modulus: PZ-22 = 18.1 IN^3/LF of wall
PZ-10 = 30.5
AZ-18 = 33.5

f = 15294 x 12 / 18.1 = 10,139 psi ok

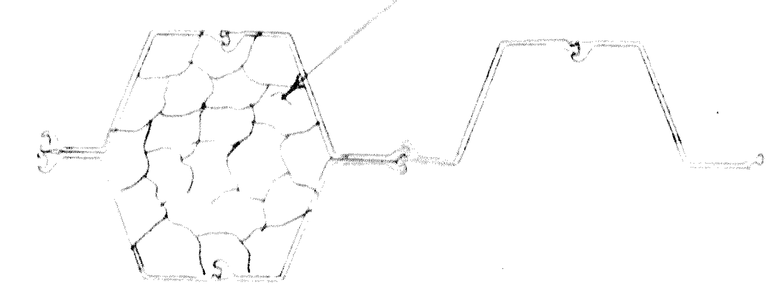




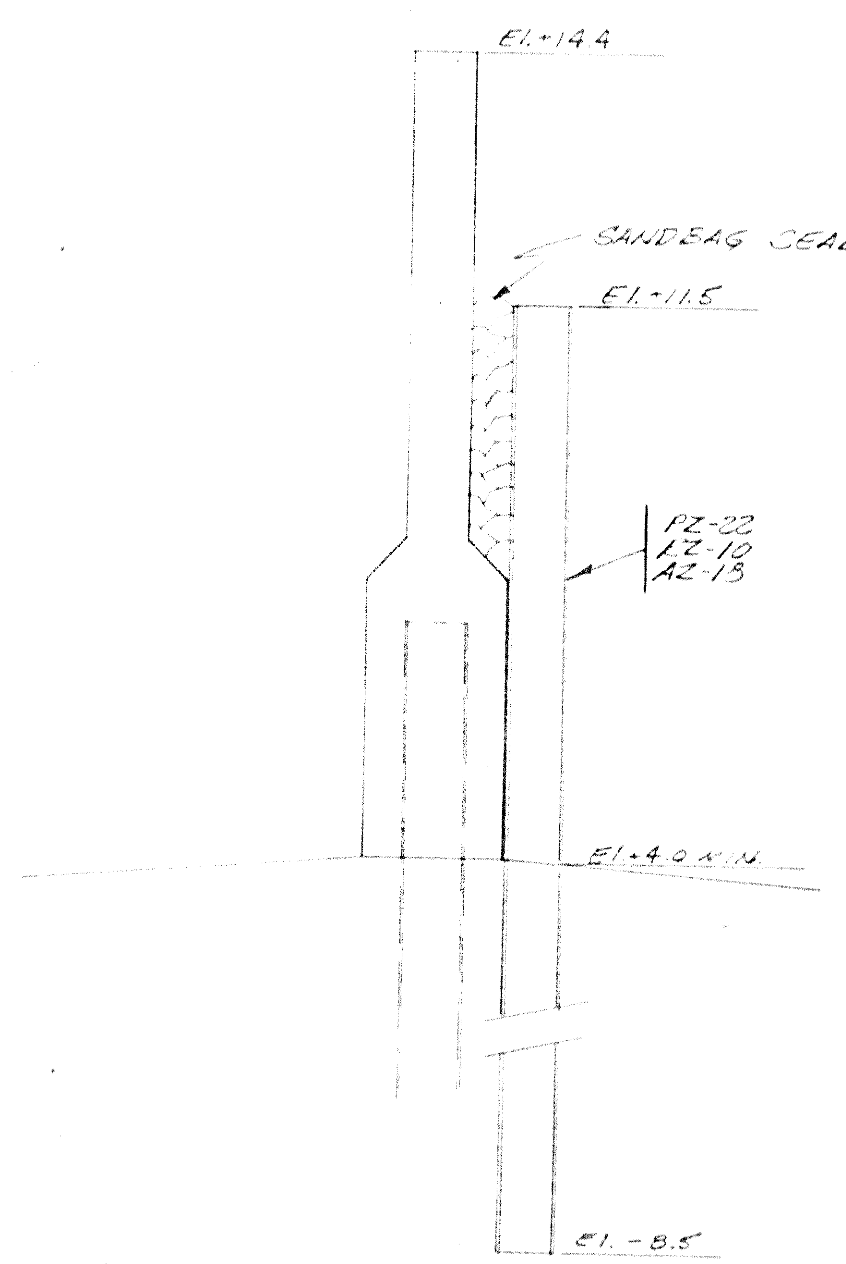




PLAN



CONDITION WHERE NO CAP EXISTS



SECTION A-A

STATE OF LOUISIANA
CHARLES L. SLOAN
REG. No. 5597
REGISTERED
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING

NO.	DATE	REVISION	BY

C. L. SLOAN ENGINEERING, INC.
Mandeville, Louisiana

DATE 8/31/94	CLIENT B&K - PROJ. # DACW29-94-B-0027 - LONDON AVE. OUTFALL CANAL
SCALE NONE	TITLE TEMPORARY FLOODWALL
BY W. Sloan	DRAWING NO. 94-8-5-3

```
10001 '"LONDON AVE. OUTFALL CANAL, Q-CASE"'
10002 '"STA. 102+30 TO 119+40 EAST SIDE FILE:CSUB"'
10003                  3    .11500000E+02    .00000000E+00
10004                  3    .10500000E+02    .62500000E+02
10005                  3    .95000000E+01    .12500000E+03
10006                  3    .85000000E+01    .18750000E+03
10007                  3    .75000000E+01    .25000000E+03
10008                  3    .65000000E+01    .31250000E+03
10009                  3    .55000000E+01    .37500000E+03
10010                  3    .45000000E+01    .43750000E+03
10011                  3    .40000000E+01    .46875000E+03
10012                  3    .40000000E+01    .00000000E+00
10013                  3    .40000000E+01   -.46458330E+03
10014                  3    .30000000E+01   -.51108330E+03
10015                  3    .20000000E+01   -.55758330E+03
10016                  3    .10000000E+01   -.60408330E+03
10017                  3    .00000000E+00   -.65058330E+03
10018                  3    .00000000E+00   -.25058330E+03
10019                  3   -.10000000E+01   -.28408330E+03
10020                  3   -.20000000E+01   -.31758330E+03
10021                  3   -.28748460E+01   -.34689070E+03
10022                  3   -.39549750E+01    .00000000E+00
10023                  3   -.70214980E+01    .98483510E+03
10024                  4   -.70214980E+01    .00000000E+00
10025                  0   -.70214980E+01    .00000000E+00
10026   -.70214980E+01  -.86774900E+01   .78125000E-02
```

```
1000 1 11.5 -8.5 1 -8.5 0 -1
1100 AZ-18
1200 29000000 7.09 250.4
```

BEAMS (SHEAR, MOMENT, DEFLECTION)

"LONDON AVE. OUTFALL CANAL, Q-CASE"
"STA. 102+30 TO 119+40 EAST SIDE FILE:CSUB"

THE REFERENCE SYSTEM SELECTED DEFINES POSITIVE FORCES AS TO THE LEFT, INCREASING MEMBER COORDINATES, AS UPWARD, AND POSITIVE MOMENTS, AS COUNTERCLOCKWISE.

THE MAXIMUM DEFLECTION IS .15 INCHES AND OCCURS AT MEMBER COORDINATE 11.50 FT.

AZ-18 HAS BEEN GIVEN TO SUPPORT THE LOAD SYSTEM.

THE WEIGHT OF THIS VERTICAL MEMBER HAS BEEN NEGLECTED.

CALCULATED EXTERNAL LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD
-7.02	POINT LD	8.68 LBF
-7.02	COUPLE	-.01 LBF-FT

INPUTTED LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD
11.50	CONTN LD	.00 LBF/SQ FT
10.50	CONTN LD	62.50 LBF/SQ FT
9.50	CONTN LD	125.00 LBF/SQ FT
8.50	CONTN LD	187.50 LBF/SQ FT
7.50	CONTN LD	250.00 LBF/SQ FT
6.50	CONTN LD	312.50 LBF/SQ FT
5.50	CONTN LD	375.00 LBF/SQ FT
4.50	CONTN LD	437.50 LBF/SQ FT
4.00	CONTN LD	468.75 LBF/SQ FT
4.00	CONTN LD	.00 LBF/SQ FT
4.00	CONTN LD	-464.58 LBF/SQ FT
3.00	CONTN LD	-511.08 LBF/SQ FT
2.00	CONTN LD	-557.58 LBF/SQ FT
1.00	CONTN LD	-604.08 LBF/SQ FT
.00	CONTN LD	-650.58 LBF/SQ FT
.00	CONTN LD	-250.58 LBF/SQ FT
-1.00	CONTN LD	-284.08 LBF/SQ FT
-2.00	CONTN LD	-317.58 LBF/SQ FT
-2.87	CONTN LD	-346.89 LBF/SQ FT
-3.95	CONTN LD	.00 LBF/SQ FT
-7.02	CONTN LD	984.84 LBF/SQ FT
-7.02	CONTN LD	.00 LBF/SQ FT

AZ-18 PROPERTIES ARE AS FOLLOWS.

MOMENT OF INERTIA= 250.40 IN. TO THE 4TH PER FOOT OF WALL
CROSS SECTIONAL AREA= 7.09 SQ IN.
ELASTIC MODULUS= 29000000. LBF/SQ IN.
DEFLECTION REFERENCE IS AT -8.500

THE MAXIMUM BENDING MOMENT IS 7387.79 LBF-FT AND OCCURS AT .75
WHICH HAS THE SHEAR FORCE OF 4.32 LBF.

DISTANCE (FEET)	SHEAR FOR (LBF)	SHEAR STR (LBF/SQIN)	BENDING MOM (LBF-FT)	DEFLECTION FROM TANG. THRU DEFLE REFERENCE (INCHES)
11.500	.0	.0	.0	.1549
11.499	.0	.0	.0	.1549
11.000	7.8	1.1	1.3	.1477
10.000	70.3	9.9	35.2	.1335
9.000	195.3	27.5	162.8	.1192
8.000	382.8	54.0	446.6	.1050
7.000	632.8	89.3	949.2	.0909
6.000	945.3	133.3	1733.1	.0770
5.000	1320.3	186.2	2860.7	.0636
4.000	1757.8	247.9	4394.5	.0509
3.000	1270.0	179.1	5912.3	.0392
2.000	735.6	103.8	6919.0	.0289
1.000	154.8	21.8	7368.1	.0202
.753	4.3	.6	7387.8	.0183
.000	-472.5	-66.6	7213.1	.0133
-1.000	-739.9	-104.4	6609.7	.0080
-2.000	-1040.7	-146.8	5722.2	.0043
-3.000	-1372.2	-193.5	4517.3	.0020
-3.954	-1518.7	-214.2	3115.1	.0008
-3.956	-1518.7	-214.2	3112.1	.0008
-4.000	-1518.4	-214.2	3045.2	.0007
-5.000	-1343.3	-189.5	1587.6	.0002
-6.000	-847.1	-119.5	465.6	.0000
-7.000	-29.8	-4.2	.4	.0000
-7.020	-9.7	-1.4	.0	.0000
-7.022	.0	.0	.0	.0000
-8.000	.0	.0	.0	.0000
-8.499	.0	.0	.0	.0000
-8.500	.0	.0	.0	.0000

M= 7387.79 / 12(7.4) = 13.4

RUN COMPLETED

```
1000 1 11.5 -8.5.1 -8.5 0 -1
1100 RZ-10
1200 29000000 7.75 172.1
```

BEAMS (SHEAR, MOMENT, DEFLECTION)

"LONDON AVE. OUTFALL CANAL, Q-CASE"
"STA. 102+30 TO 119+40 EAST SIDE FILE:CSUB"

THE REFERENCE SYSTEM SELECTED DEFINES POSITIVE FORCES AS TO THE LEFT, INCREASING MEMBER COORDINATES, AS UPWARD, AND POSITIVE MOMENTS, AS COUNTERCLOCKWISE.

THE MAXIMUM DEFLECTION IS .23 INCHES AND OCCURS AT MEMBER COORDINATE 11.50 FT.

RZ-10 HAS BEEN GIVEN TO SUPPORT THE LOAD SYSTEM.

THE WEIGHT OF THIS VERTICAL MEMBER HAS BEEN NEGLECTED.

CALCULATED EXTERNAL LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD
-7.02	POINT LD	8.68 LBF
-7.02	COUPLE	-.01 LBF-FT

INPUTTED LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD
11.50	CONTN LD	.00 LBF/SQ FT
10.50	CONTN LD	62.50 LBF/SQ FT
9.50	CONTN LD	125.00 LBF/SQ FT
8.50	CONTN LD	187.50 LBF/SQ FT
7.50	CONTN LD	250.00 LBF/SQ FT
6.50	CONTN LD	312.50 LBF/SQ FT
5.50	CONTN LD	375.00 LBF/SQ FT
4.50	CONTN LD	437.50 LBF/SQ FT
4.00	CONTN LD	468.75 LBF/SQ FT
4.00	CONTN LD	.00 LBF/SQ FT
4.00	CONTN LD	-464.58 LBF/SQ FT
3.00	CONTN LD	-511.08 LBF/SQ FT
2.00	CONTN LD	-557.58 LBF/SQ FT
1.00	CONTN LD	-604.08 LBF/SQ FT
.00	CONTN LD	-650.58 LBF/SQ FT
.00	CONTN LD	-250.58 LBF/SQ FT
-1.00	CONTN LD	-284.08 LBF/SQ FT
-2.00	CONTN LD	-317.58 LBF/SQ FT
-2.87	CONTN LD	-346.89 LBF/SQ FT
-3.95	CONTN LD	.00 LBF/SQ FT
-7.02	CONTN LD	984.84 LBF/SQ FT
-7.02	CONTN LD	.00 LBF/SQ FT

RZ-10 PROPERTIES ARE AS FOLLOWS.

MOMENT OF INERTIA= 172.10 IN. TO THE 4TH PER FOOT OF WALL
CROSS SECTIONAL AREA= 7.75 SQ IN.
ELASTIC MODULUS= 29000000. LBF/SQ IN.
DEFLECTION REFERENCE IS AT -8.500

THE MAXIMUM BENDING MOMENT IS 7387.79 LBF-FT AND OCCURS AT .75
WHICH HAS THE SHEAR FORCE OF 4.32 LBF.

DISTANCE (FEET)	SHEAR FOR (LBF)	SHEAR STR (LBF/SQIN)	BENDING MOM (LBF-FT)	DEFLECTION FROM TANG. THRU DEFLE REFERENCE (INCHES)
11.500	.0	.0	.0	.2253
11.499	.0	.0	.0	.2253
11.000	7.8	1.0	1.3	.2150
10.000	70.3	9.1	35.2	.1942
9.000	195.3	25.2	162.8	.1735
8.000	382.8	49.4	446.6	.1528
7.000	632.8	81.7	949.2	.1323
6.000	945.3	122.0	1733.1	.1121
5.000	1320.3	170.4	2860.7	.0926
4.000	1757.8	226.8	4394.5	.0740
3.000	1270.0	163.9	5912.3	.0570
2.000	735.6	94.9	6919.0	.0420
1.000	154.8	20.0	7368.1	.0294
.753	4.3	.6	7387.8	.0267
.000	-472.5	-61.0	7213.1	.0193
-1.000	-739.9	-95.5	6609.7	.0117
-2.000	-1040.7	-134.3	5722.2	.0063
-3.000	-1372.2	-177.1	4517.3	.0029
-3.954	-1518.7	-196.0	3115.1	.0011
-3.956	-1518.7	-196.0	3112.1	.0011
-4.000	-1518.4	-195.9	3045.2	.0010
-5.000	-1343.3	-173.3	1587.6	.0003
-6.000	-847.1	-109.3	465.6	.0000
-7.000	-29.8	-3.8	.4	.0000
-7.020	-9.7	-1.2	.0	.0000
-7.022	.0	.0	.0	.0000
-8.000	.0	.0	.0	.0000
-8.499	.0	.0	.0	.0000
-8.500	.0	.0	.0	.0000

M = 7387.79 / 12(.75)

29.# psi / 29.2

RUN COMPLETED

1000 1 11.5 -8.5 1 -8.5 0 -1
1100 PZ-22
1200 29000000 ~~18.1~~ 11.96 84.4

BEAMS (SHEAR, MOMENT, DEFLECTION)

"LONDON AVE. OUTFALL CANAL, Q-CASE"
"STA. 102+30 TO 119+40 EAST SIDE FILE:CSUB"

THE REFERENCE SYSTEM SELECTED DEFINES POSITIVE FORCES AS TO THE LEFT, INCREASING MEMBER COORDINATES, AS UPWARD, AND POSITIVE MOMENTS, AS COUNTERCLOCKWISE.

THE MAXIMUM DEFLECTION IS .46 INCHES AND OCCURS AT MEMBER COORDINATE 11.50 FT.

PZ-22 HAS BEEN GIVEN TO SUPPORT THE LOAD SYSTEM.

THE WEIGHT OF THIS VERTICAL MEMBER HAS BEEN NEGLECTED.

CALCULATED EXTERNAL LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD
-7.02	POINT LD	8.68 LBF
-7.02	COUPLE	-.01 LBF-FT

INPUTTED LOADS

DISTANCE FROM REFERENCE(FT)	TYPE OF LOAD	MAGNITUDE OF LOAD
11.50	CONTN LD	.00 LBF/SQ FT
10.50	CONTN LD	62.50 LBF/SQ FT
9.50	CONTN LD	125.00 LBF/SQ FT
8.50	CONTN LD	187.50 LBF/SQ FT
7.50	CONTN LD	250.00 LBF/SQ FT
6.50	CONTN LD	312.50 LBF/SQ FT
5.50	CONTN LD	375.00 LBF/SQ FT
4.50	CONTN LD	437.50 LBF/SQ FT
4.00	CONTN LD	468.75 LBF/SQ FT
4.00	CONTN LD	.00 LBF/SQ FT
4.00	CONTN LD	-464.58 LBF/SQ FT
3.00	CONTN LD	-511.08 LBF/SQ FT
2.00	CONTN LD	-557.58 LBF/SQ FT
1.00	CONTN LD	-604.08 LBF/SQ FT
.00	CONTN LD	-650.58 LBF/SQ FT
.00	CONTN LD	-250.58 LBF/SQ FT
-1.00	CONTN LD	-284.08 LBF/SQ FT
-2.00	CONTN LD	-317.58 LBF/SQ FT
-2.87	CONTN LD	-346.89 LBF/SQ FT
-3.95	CONTN LD	.00 LBF/SQ FT
-7.02	CONTN LD	984.84 LBF/SQ FT
-7.02	CONTN LD	.00 LBF/SQ FT

PZ-22 . PROPERTIES ARE AS FOLLOWS.

MOMENT OF INERTIA= 84.40 IN. TO THE 4TH PER FOOT OF WALL
CROSS SECTIONAL AREA= 18.10 SQ IN.
ELASTIC MODULUS= 29000000. LBF/SQ IN.
DEFLECTION REFERENCE IS AT -8.500

THE MAXIMUM BENDING MOMENT IS 7387.79 LBF-FT AND OCCURS AT .75
WHICH HAS THE SHEAR FORCE OF 4.32 LBF.

DISTANCE (FEET)	SHEAR FOR (LBF)	SHEAR STR (LBF/SQIN)	BENDING MOM (LBF-FT)	DEFLECTION FROM TANG. THRU DEFLE REFERENCE (INCHES)
11.500	.0	.0	.0	.4594
11.499	.0	.0	.0	.4594
11.000	7.8	.4	1.3	.4383
10.000	70.3	3.9	35.2	.3960
9.000	195.3	10.8	162.8	.3537
8.000	382.8	21.1	446.6	.3115
7.000	632.8	35.0	949.2	.2697
6.000	945.3	52.2	1733.1	.2286
5.000	1320.3	72.9	2860.7	.1887
4.000	1757.8	97.1	4394.5	.1509
3.000	1270.0	70.2	5912.3	.1163
2.000	735.6	40.6	6919.0	.0857
1.000	154.8	8.6	7368.1	.0599
.753	4.3	.2	7387.8	.0544
.000	-472.5	-26.1	7213.1	.0393
-1.000	-739.9	-40.9	6609.7	.0238
-2.000	-1040.7	-57.5	5722.2	.0128
-3.000	-1372.2	-75.8	4517.3	.0059
-3.954	-1518.7	-83.9	3115.1	.0023
-3.956	-1518.7	-83.9	3112.1	.0023
-4.000	-1518.4	-83.9	3045.2	.0021
-5.000	-1343.3	-74.2	1587.6	.0005
-6.000	-847.1	-46.8	465.6	.0001
-7.000	-29.8	-1.6	.4	.0000
-7.020	-9.7	-.5	.0	.0000
-7.022	.0	.0	.0	.0000
-8.000	.0	.0	.0	.0000
-8.499	.0	.0	.0	.0000
-8.500	.0	.0	.0	.0000

$N = \frac{7387.79 \text{ ft-lb}}{18.1 (12)}$

$= 34 \text{ psi}$

RUN COMPLETED

1 GUIZERIX

2 HASSENBOEHLER

~~3~~ GUGGENHEIMER

_____ CINDY

_____ SUSPENSE DATE

_____ DISTRIBUTE

_____ FILE

_____ ROUTE

_____ RELEASE

Engineering Div
Route Slip
Date Rec: 9/23/94

MTX #: 94-5325

( ) Mr. Tickner

( ) Mr. Marsalone

( ) Mrs. Jackson

( ) Mr. Settoon

( ) Mr. Fairless

( ) Mr. Picciola

( ) Mr. Laurent

( ) Mr. Flock

(✓) Mr. Guizerix

( ) Mr. Brantley

( ) Mr. Satterlee

COMMENTS: _____

S: / /94

Sewerage & Water Board OF NEW ORLEANS

G. JOSEPH SULLIVAN
General Superintendent

625 ST. JOSEPH STREET
NEW ORLEANS, LA., 70165 • 585-2365

September 22, 1994

U.S. Army Corps of Engineers
New Orleans District
P.O. Box 60267
New Orleans, Louisiana 70160-0267

Attention: Mr. Eugene Tickner
Chief of Engineering

RE: **London Avenue Outfall Canal, Parallel Protection, Mirabeau Avenue to Robert E. Lee Boulevard, West Bank, Mirabeau Avenue to Leon C. Simon Boulevard, East Bank Electrical Submittal**

Gentlemen:

We have received submittal data on Electric Power Cable Conduit, Splice Kits, etc. intended to be furnished under subject contract.

This submittal is rejected since the printing on several sheets were unreadable.

However, Mr. Mike Commiskey of B&K Construction Company will be resubmitting the data on the above captioned contract to U.S. Army Corps of Engineers.

Please furnish the S&WB with six (6) copies of the above submittal for our review and approval.

Very truly yours,

G. Joseph Sullivan

GENERAL SUPERINTENDENT

GJS/CTP/S

CC: Mr. R. St. Germain
Mr. J. Huerkamp
Mr. G. Sarrat
Mr. C. Perret

AFTER 5 DAYS RETURN TO
SEWERAGE AND WATER BOARD
ELECTRICAL ENGINEERING
8800 S. CLAIBORNE AVE.
NEW ORLEANS, LA. 70118

ATTN: Mr. Eugene Tickner, *Chief of Engineering*
U.S. Army Corps of Engineers
New Orleans District
P.O. Box 60267
New Orleans, Louisiana 70160-0267

70160-0267

DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P.O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

FILE COPY

REPLY TO
ATTENTION OF:

September 16, 1994

Engineering Division
Structures Branch

Mr. G. Joseph Sullivan
General Superintendent
Sewerage and Water Board of
New Orleans
625 Saint Joseph Street
New Orleans, Louisiana 70165

Dear Mr. Sullivan:

Our construction contract for the London Avenue Outfall Canal, Parallel Protection, Mirabeau Avenue to Robert E. Lee Boulevard, West Bank, Mirabeau Avenue to Leon C. Simon Boulevard, East Bank was awarded to B & K Construction Company on July 11, 1994.

Enclosed is a copy of B & K Construction Company's submittal for materials involving your electrical feeder lines. Please review for compliance with the plans and specifications and provide us your approval or comments by September 27, 1994.

The electrical plans and specifications were prepared in partnership with your office and forwarded by previous correspondence.

Please contact Mr. Walter Baumy of my office at (504) 862-2656 if you have any questions.

Sincerely,

GUIZERIX
CELMN-ED-T

TICKNER
CELMN-ED

W. Eugene Tickner
Chief, Engineering Division

Enclosure

Copy Furnished:

CELMN-CD-CC

TRANSMISSION RESULT REPORT (SEP 15 '94 08:35AM)

ENG DIV ADMIN UNIT

(AUTO)

THE FOLLOWING FILE(S) ERASED

FILE	FILE TYPE	OPTION	TEL NO.	PAGE	RESULT
090	TRANSMISSION		9-8650403	07	OK

ERRORS

1) HANG UP OR LINE FAIL 2) BUSY 3) NO ANSWER 4) NO FACSIMILE CONNECTION

FACSIMILE TRANSMITTAL HEADER SHEET

For use of this form, see AR 25-11; the proponent agency is ODISC4

COMMAND/ OFFICE	NAME/ OFFICE SYMBOL	OFFICE TELEPHONE NO. *(AUTOVON/Comm.)*	FAX NO. *(AUTOVON/Comm.)*
FROM:	Angela DeSoto	862-2733	862-1585
TO:	Clayton Pereste		865-0403

CLASSIFICATION	PRECEDENCE	NO. PAGES *(Including this Header)*	DATE-TIME	MONTH	YEAR	RELEASER'S SIGNATURE
		7	9/15/94			

REMARKS

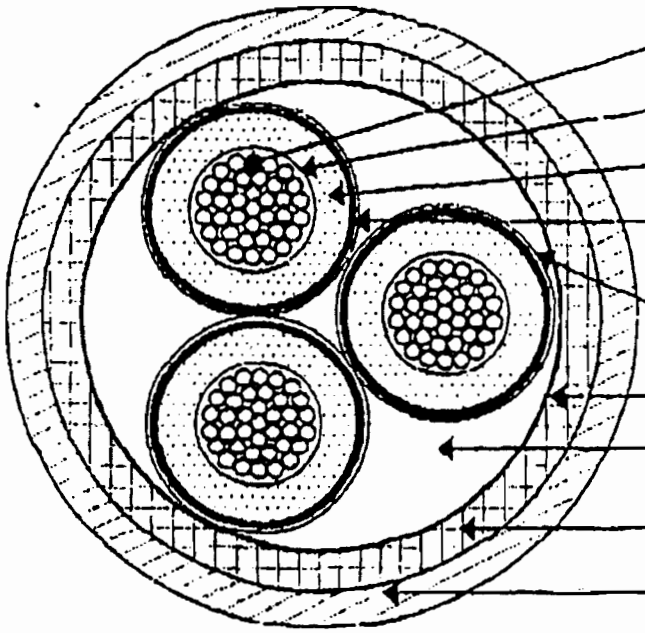
Space Below For Communications Center Use Only

DA FORM 3918-R, JUL 90 DA FORM 3918-R, AUG 72 IS OBSOLETE V2.00

Clayton,

This is an advanced copy of B+K's electrical submittal for the next London Ave. contract

Angela



500 kcmil (37x) BARE CLASS B STRANDED COPPER CONDUCTOR

EXTRUDED SEMICONDUCTING STRAND SCREEN (EPR)

INSULATION - .220" OKOGUARD® (EPR) NOM. OD=1.284"

0.032" EXTRUDED SEMICONDUCTING INSULATION SCREEN (EPR) NOM. OD=1.383"

0.005" BARE COPPER TAPE SHIELD

BINDER TAPE

POLYPROPYLENE FILLERS

0.110" LEAD SHEATH NOM. OD= 3.228"

0.095" JACKET-OKOSEAL® (PVC) NOM. OD= 3.432"

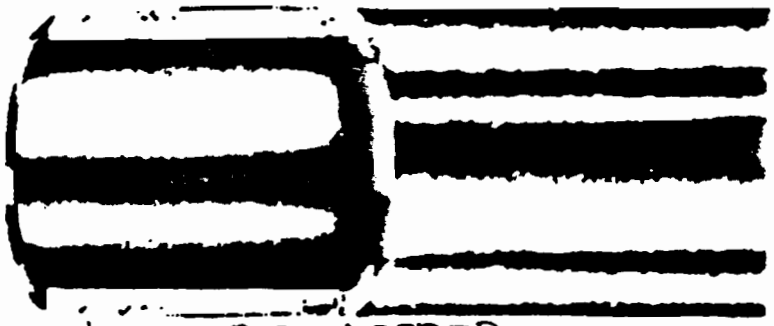
THIS DRAWING IS CERTIFIED TO BE CORRECT Gustav V Fitzpatrick 11/17/93

CABLE PRINT LEGEND: OKONITE _ 3/C 500 KCMIL CU OKOGUARD (EP) - PVC 15KV SHLD 133% INSUL LEVEL 220 MILS {LIGHTNING BOLT POWER CABLE ID}

3/C 500 KCMIL OKOGUARD SHLD LEAD SHEATH OKOSEAL(PVC) 15KV 133% INSUL LEV POWER CABLE

THE OKONITE COMPANY RAMSEY, NJ USA	DATE: 11-18-93 SCALE: NTS DR. TR. CH. APP.	REVISIONS DRAWING NUMBER CS-7070

Rigid Steel Conduit



Ten-Foot Lengths with One Coupling
Available in hot dipped galvanized or electro-galvanized. Furnished in 10-foot lengths with both ends threaded, with coupling screwed on one end.

Size In.	Wt. Lbs. Per 100 Ft.	Outside Diameter Inches	Wall Thickness Inches
½	79	.840	.109
¾	105	1.050	.113
1	153	1.315	.133
1¼	201	1.660	.140
1½	249	1.900	.145
2	334	2.375	.154
2½	527	2.875	.203
3	690	3.500	.216
3½	831	4.000	.226
4	982	4.500	.237
5	1334	5.563	.258
6	1770	6.625	.280

CONDUIT FITTINGS (continued)

Corrosion Resistant PVC Coated Rigid Conduit Straps

- *Malleable iron.*

Catalog Number	Size	Bolt Size	Unit Qty.	Std. Pkg.	Wt. per 100	Trade Cost Per 100 Less Than Unit Pkg.	Unit Pkg.	Std. Pkg.	NAED Number
1275CR	½"	¼"	100	500	5	$ 270.84	$ 211.43	$ 169.15	786210-82646
1276CR	½"	¼"	100	500	5	255.55	199.65	159.72	786210-82647
1277CR	¾"	¼"	50	500	6	309.31	241.65	193.32	786210-82649
1278CR	1"	¼"	50	100	9	487.40	380.78	304.63	786210-82662
1279CR	1¼"	⅜"	25	100	16	611.90	478.05	382.44	786210-82668
1280CR	1½"	⅜"	25	50	22	806.88	630.38	504.29	786210-82670
1281CR	2"	½"	5	25	41	1171.58	915.30	732.24	786210-82679

LR 2884

UL not applicable.

Entrance Ells*

- *Aluminum.*

Thomas & Betts entrance ells mount flat against wall eliminating need for offsetting the conduit. Designed for a straight pull in either direction and carefully bushed, these entrance ells make it easy to pull heavy wires without damage to insulation.

Catalog Number	Size	Unit Qty.	Std. Pkg.	Wt. per 100	Trade Cost Per 100 Less Than Unit Pkg.	Unit Pkg.	Std. Pkg.	NAED Number
1490	½"	10	50	25	$ 497.08	$ 388.35	$ 310.68	786210-01490
1491	¾"	10	50	32	616.48	481.81	385.29	786210-01491
1492	1"	5	25	50	1002.48	783.18	626.55	786210-01492
1493	1¼"	2	10	80	1376.20	1076.72	861.38	786210-01493
1494	1½"	2	10	116	3188.40	2475.38	1980.29	786210-01494
1495	2"	1	5	190		3760.38	3008.30	786210-01495

E 23018

LR 2284 & LR 589

* Suitable for use in hazardous location where general purpose equipment is specifically permitted by the NEC; Class I Div. 2; Class II, Div. 1 & 2; Class III, Div. 1 & 2, NEC 501-4(b); 502-4(s) (b); 503-3(a) (b).

Pipe Spacers

- *Malleable iron.*
- *Pre-mountable.*
- *Stackable to eliminate offsetting.*

Catalog Number	Size	Unit Qty.	Std. Pkg.	Wt. per 100	Trade Cost Per 100 Less Than Unit Pkg.	Unit Pkg.	Std. Pkg.	NAED Number
1350	½"-¾"-1"	50	100	10	$ 108.68	$ 84.91	$ 67.93	786210-01350
1351	1¼"-1½"-2"	25	50	25	297.58	232.47	185.98	786210-01351
1352	2½"-3"	10	20	56	688.78	688.11	550.49	786210-01352
1353	3½"-4"	1	5	77	2639.05	2061.78	1649.41	786210-01353
1354	4½"-5"-6"	1	4	138	13010.56	10164.50	8131.60	786210-01354

LR 2884

UL not applicable.

CONDUIT FITTINGS (continued)

Pipe Straps

- *Steel.*
- *Designed to fit conduit snugly.*
- *High reinforcing ribs increase strength, reduce weight.*

Catalog Number	Size	Bolt Size	Unit Qty.	Std. Pkg.	Wt. per 100	Trade Cost Per 100 Less Than Unit Pkg.	Unit Pkg.	Std. Pkg.	NAED Number
1210	⅜"	¼"	100	500	6	$ 36.24	$ 28.31	$ 22.65	786210-01210
1211	½"	¼"	100	500	10	27.05	21.13	16.91	786210-01211
1212	¾"	¼"	50	500	13	33.07	25.83	20.67	786210-01212
1213	1"	¼"	50	100	21	65.55	51.21	40.97	786210-01213
1214	1¼"	⅜"	25	100	30	83.79	65.46	52.37	786210-01214
1215	1½"	⅜"	10	50	38	106.60	83.28	66.63	786210-01215
1216	2"	⅜"	5	25	48	190.43	148.77	119.02	786210-01216

LR 2884

UL not applicable.

Pipe Straps

- *Malleable iron.*

Catalog Number	Size	Bolt Size	Unit Qty.	Std. Pkg.	Wt. per 100	Trade Cost Per 100 Less Than Unit Pkg.	Unit Pkg.	Std. Pkg.	NAED Number
1275	⅜"	¼"	100	500	5	$ 46.11	$ 36.02	$ 28.82	786210-01275
1276	½"	¼"	100	500	5	41.42	32.38	25.89	786210-01276
1277	¾"	¼"	100	500	6	59.12	46.18	36.95	786210-01277
1278	1"	¼"	50	100	9	83.85	65.51	52.41	786210-01278
1279	1¼"	⅜"	25	100	16	158.32	122.12	97.70	786210-01279
1280	1½"	⅜"	25	50	22	183.26	143.17	114.54	786210-01280
1281	2"	½"	5	25	41	358.08	279.75	223.80	786210-01281
1282	2½"	½"	5	25	71	732.84	572.53	458.03	786210-01282
1283	3"	½"	5	10	100	969.24	757.22	605.78	786210-01283
1284	3½"	⅝"	1	5	140	1499.40	1171.41	937.13	786210-01284
1285	4"	⅝"	1	5	155	3328.32	2600.25	2080.20	786210-01285
1286	4½"	⅝"	1	5	205	8606.17	5161.07	4128.86	786210-01286
1287	5"	⅝"	1	5	245	–	9153.33	7322.66	786210-01287
1288	6"	⅝"	–	1	395	–	–	7858.49	786210-01288

LR 2884

UL not applicable.

STRAIGHT SPLICE KIT (2 WAY)

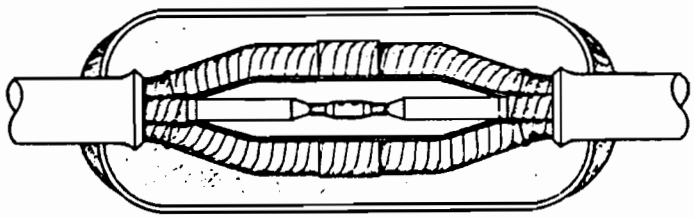
*Polymeric Insulated Lead Sheath Cable

Three Conductor

FOR A RELIABLE MEANS OF TERMINATING THIS TYPE CABLE, REFER TO THE MAC POTHEAD CATALOG OR CONSULT FACTORY

TYPE RLS3

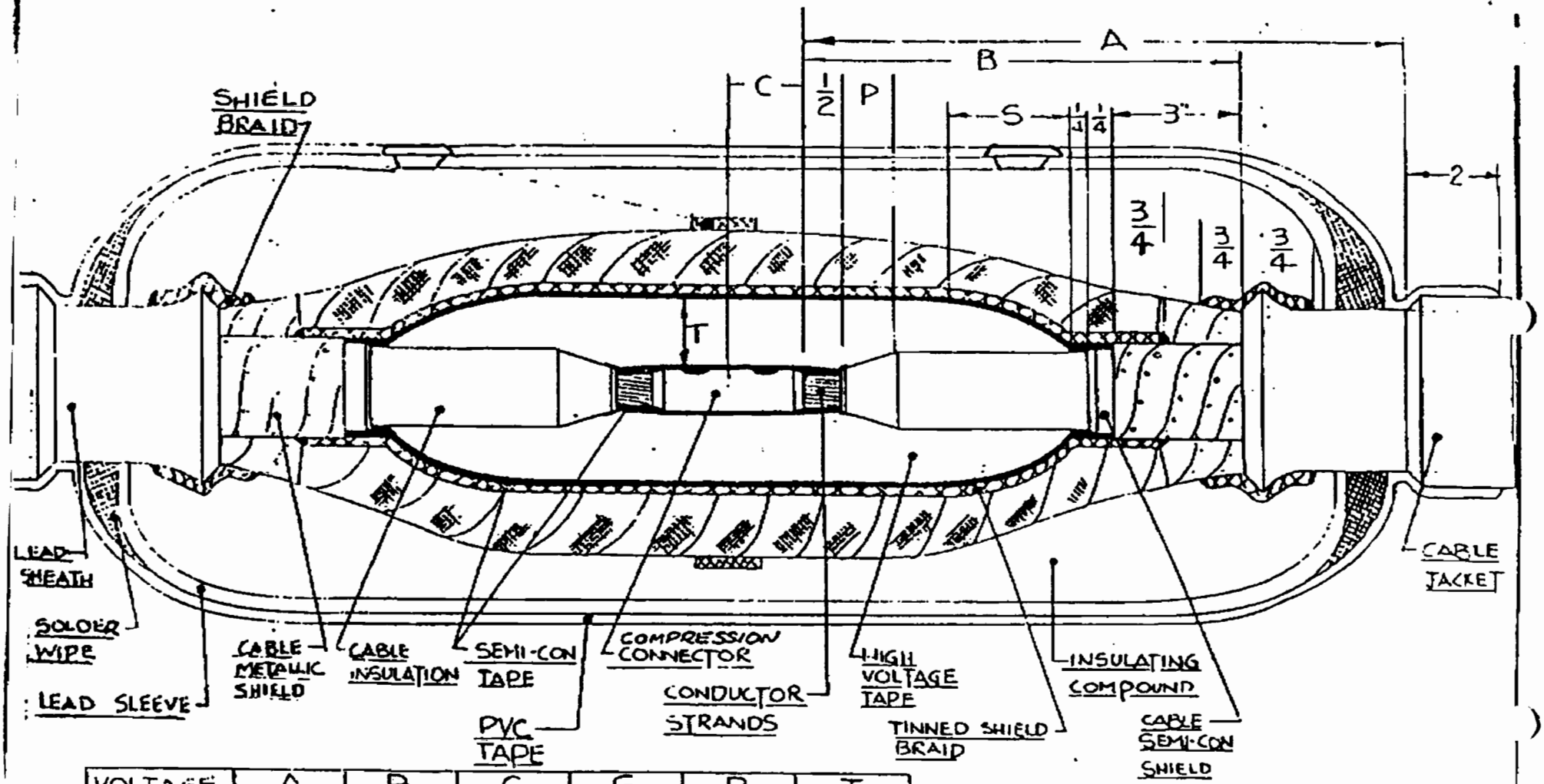
A complete unit splice kit for making a straight, 2 way splice of a three conductor rubber, cross-linked polyethylene or other *polymeric cable with a lead sheath, the MAC RLS 3 is complete with step by step installation instructions and all the proper grade materials necessary for making the splice.



CABLE SIZE	5 KV 7.5 KV GRD. CATALOG NUMBER	7.5 KV UNGRD. 15 KV GRD. CATALOG NUMBER	15 KV UNGRD. CATALOG NUMBER	27 KV GRD. CATALOG NUMBER	35 KV GRD. CATALOG NUMBER
8	RLS3-108	RLS3-208	RLS3-308	---	---
6	RLS3-106	RLS3-206	RLS3-306	---	---
4	RLS3-104	RLS3-204	RLS3-304	---	---
2	RLS3-102	RLS3-202	RLS3-302	RLS3-402	---
1	RLS3-101	RLS3-201	RLS3-301	RLS3-401	RLS3-501
1/0	RLS3-110	RLS3-210	RLS3-310	RLS3-410	RLS3-510
2/0	RLS3-120	RLS3-220	RLS3-320	RLS3-420	RLS3-520
3/0	RLS3-130	RLS3-230	RLS3-330	RLS3-430	RLS3-530
4/0	RLS3-140	RLS3-240	RLS3-340	RLS3-440	RLS3-540
250	RLS3-1250	RLS3-2250	RLS3-3250	RLS3-4250	RLS3-5250
300	RLS3-1300	RLS3-2300	RLS3-3300	RLS3-4300	RLS3-5300
350	RLS3-1350	RLS3-2350	RLS3-3350	RLS3-4350	RLS3-5350
400	RLS3-1400	RLS3-2400	RLS3-3400	RLS3-4400	RLS3-5400
500	RLS3-1500	RLS3-2500	RLS3-3500	RLS3-4500	RLS3-5500
600	RLS3-1600	RLS3-2600	RLS3-3600	RLS3-4600	RLS3-5600
750	RLS3-1750	RLS3-2750	RLS3-3750	RLS3-4750	RLS3-5750
1000	RLS3-11000	RLS3-21000	RLS3-31000	RLS3-41000	RLS3-51000

NOTE: All catalog numbers on this page refer to copper conductors only. Add suffix—AC if ordering or specifying aluminum.

*Polymeric is a term used to describe the following insulations Oil Base Rubber, Butyl Rubber, PVC, Low and High Density Polyethylene, Ethylene Propylene Rubber, and Cross Linked Polyethylene



VOLTAGE	A	B	C	S	P	T
15kV. ungr.	15"	$9\frac{1}{4}$"	$1\frac{1}{8}$"	$3\frac{1}{4}$"	2"	$\frac{3}{8}$"

STRAIGHT SPLICE 3/C POLYMERIC INSULATED, LEAD COVERED, SHIELDED

NOTE: SIZE CRIMP SLEEVE FOR 400 MCM X 500 MCM.